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The Architecture of our Large Provincial Towns.

I.—LIVERPOOL.

WE propose, at convenient intervals, to pass in review the architecture of our leading provincial towns, giving illustrations of some of the principal buildings and, if possible, of some of the street architecture in each, along with such remarks and criticisms as the subject may suggest. London is an architectural world in itself; its principal buildings have been the subject of much architectural criticism, and many of them are of world-wide fame. The more restricted limits of even a large provincial town present more possibility of taking a comprehensive survey of its architectural character, and often it may possess buildings of considerable merit and interest which are not very widely known. And almost every town has its own peculiar architectural physiognomy, arising out of its position, the building materials chiefly employed, the prevalent occupations in it, &c., which makes each a study in itself. Some towns leave an impression of dulness behind them, others an impression of picturesqueness; it is of interest to consider on what these impressions depend. The object of these articles, in short, is critical, not historical, they are intended as records of impressions rather than of statistics, and in that respect may perhaps not be without interest to some of the dwellers in the towns in question who take an interest in their architecture. Most places have a local building which is their great architectural ornament, to which they are attached by long association; how does it appear to the spectator who sees it without any such associations to influence his judgment?

The City of Liverpool, at which the British Association has been holding its meeting this week, has been on that account rather prominently under notice just now; but there are other and more permanent reasons for giving it the first place. It possesses the most remarkable and most celebrated modern building of any provincial city in England; it is one of the few of our large towns (if it be not the only one) which can boast of a Town Hall dating more than a century back, and by an architect famous in his day; it is one of the chief places of landing and embarkation in the kingdom, and the first city seen by many visitors to England; and it is a city with a splendid natural situation, on the margin of a broad estuary, and built on a site with a slope upwards from the water to higher ground, not steep enough indeed to give the romantic effect of such a city as Edinburgh, but sufficiently so to be both more effective and more sanitary than a flat site. Could Liverpool have been built and laid out for effect on a preconceived plan, there was enough advantage in the site to have rendered it one of the most effective and grandiose cities in the world. But in the modern period cities grow up piecemeal and on no settled plan, and it is only after they have thus put themselves together by a process of accumulation that one can reflect, when it is too late, what might have been effected if one could plan and design a city as one designs a Town Hall or a mansion.

In the sixteenth century Liverpool was mainly one principal street parallel to the bank of the Mersey, with a mediæval castle at its southern end, where St. George's Church now stands;* and a shorter street running down to the bank. Both the names and the old line of route are preserved in Castle-street and Water-street, the former of which, facing the Town Hall, is still the largest and best street in the business part of the city. Other streets preserve in their names an interesting memorandum of the ancient local colour and surroundings—"Dale"-street, "Moor Fields," "Old Hall" street, "Tithe Barn" street, names given when the open land and the sites of the mediæval buildings were invaded by the first extensions of the town, just as in London we have "Old Bourne," "Moor Gate," "Wall Brook," and so on. It always interesting to meet with these names recalling a bygone condition of things, and try to picture to ourselves the appearance of the city when such names were literal expressions of fact. But it is of modern Liverpool and her buildings that we have now to speak.

The foremost building in Liverpool is unquestionably St. George's Hall, designed by Harvey Lonsdale Elmes, and completed after his death, which occurred in 1847, by Professor Cockerell. This is not, as might be supposed from its name, simply one great hall with the usual subsidiary rooms, but really a group of four separate halls, each of considerable size, designed so as to present as much as possible a uniform exterior. The building, the total length of which is over 450 ft., is divided transversely into four principal divisions; first, at the south end, an assize court for criminal cases, about 50 ft. square; next, a great hall, the actual St. George's Hall, for musical performances and public meetings, 169 ft. long, and 74 ft. wide, or 100 ft. including the range of aisle-like recesses on either side; then another assize court, for civil causes, similar to the first; and beyond that again a concert room, in the form of a nearly circular ellipse, 75 ft. long. The great hall, which is entered directly from one of the lateral porticos, is ceiled in the shape of a semi-circular barrel-vault, 84 ft. high, with smaller vaults over each of the five recesses on either side intersecting the main vault near its springing; the ceilings are panelled and elaborately ornamented in plaster, and further decorated by colour and gilding, as are also the walls and galleries all round the hall. The effect of the ceiling colouring, which was originally very delicate and refined, has been a good deal spoiled by its coarser treatment in the recent renewal of the decoration. In front of the piers and in the angles are placed large columns of polished red granite, standing on grey and red granite pedestals, and further raised above the main floor by a *perron* of two steps extending all round. The central floor has an inlay of variously coloured marbles and encaustic tiles decorated with figure subjects, but it is very seldom seen, as it has been found necessary, for convenience and safety at public meetings, to level up the whole area of the hall by means of a wooden platform. This is a great disadvantage architecturally to the interior, but it must be admitted that Elmes's section of the floor was more calculated for effect than for convenience. The hall is lighted by windows along the west side, and by large lunettes, filled, unfortunately, by somewhat coarse and gaudy stained glass at either end; the east side, under the entrance portico, is windowless. At the south end it is only separated from the court of justice by an open screen of grey granite columns, partly filled by gates of gilded bronze, while

* The last vestige of the Castle seems to have been removed in 1726 (see Picton's "Memorials of Liverpool").

at the north end is placed a large (and fine) organ. For music the hall is bad (though it was built partly as a music-room), and for speaking very much worse, and the courts share the same disadvantage. The small concert room is excellent, acoustically, and a very pretty room besides. One of the best parts of the interior is the staircase and entrance hall under the concert room. The exterior, which, except for the Corinthian capitals of the columns and pilasters which surround it, is more than Doric in the simplicity of its masses and the severity of its details, produces very different effects upon the spectator, according to the state of the atmosphere and the time of the day. Built of a sandstone, originally light-coloured, but now become a uniform dark brownish-grey, and with its principal front facing east, when seen in dull or rainy weather, and especially in the afternoon, the impression is purely one of overpowering size and gloom, and, in such circumstances, it requires a lively imagination to call the building beautiful; viewed, however, on a clear sunny morning, when the columns of the porticos are able to detach themselves from their backgrounds, and when the lines and surfaces of the walls can be clearly seen, there is more chance of agreeing with Fergusson's opinion that the exterior of St. George's Hall "is quite unrivalled, and produces an effect of grandeur unequalled by any other modern building known." If ever the sculptural decoration contemplated by the architect (and now, fortunately, commenced) is completed, the whole building will be very much brightened up, and will be seen to far greater advantage.

To attempt to assign places, in any definite order of precedence, to the other important buildings of Liverpool, public or private, would be as difficult as it would be invidious; our survey of the central quarters of the city will therefore follow as closely as possible a purely geographical sequence. Around St. George's Hall are grouped some half-dozen buildings worthy of separate notice. Facing its northern end is a range of public buildings which, for combined dignity and uniformity of character and advantageousness of position, it would be hard to parallel anywhere. Three of these, the Free Public Library and Museum, the Picton Reading Room, and the Walker Art Gallery, though by different architects, are all connected together, and possess a strong sort of family likeness to each other, and to St. George's Hall, being all designed with a large "order" of Roman-Corinthian columns and with much of the same severity of general treatment, besides being all built of the same hard, dark-looking sandstone. The Free Library and Museum (Weightman, Borough Surveyor, 1860) is the oldest of the group, and the plainest, but it has a reposeful aspect which seems properly expressive of its purposes; the contents of the Museum collections have now outgrown the capacity of the building, and a large extension is soon to be made at its western end. This addition is to be combined with accommodation for the Schools of Science, Art, and Technology, and has been the subject of a competition, lately illustrated and described in our columns, in which the first premium was awarded to Mr. E. W. Mountford. The Picton Reading Room, which fills up the space between the Library and the Art Gallery, consists of a fine circular hall, 100 ft. in diameter, and 66 ft. high, lighted entirely from an eye in the centre of its domed roof, with very good effect, the walls being lined with book-cases; externally it is surrounded by a colonnade of very satisfactory proportions. One thing which especially, and most favourably distinguishes the Picton Reading Room from almost every other building in Liverpool designed upon Greek or Roman models, is the recognition of the importance of the frieze in those styles of architecture. It stands almost alone in the possession of a frieze decorated with carved foliage, a thing absolutely essential to the spirit of a Corinthian design. In all the ancient styles the frieze is pre-eminently the place for ornament, and for the best and most delicate enrichments to be found on the exterior; and, while the appropriate degree and method of ornamental treatment to be used in adaptations from such examples must of course vary very much, to leave, in any instance, the frieze absolutely plain and naked, looking as if it had been altogether forgotten, while elaborate carving is lavished upon capitals, and, still worse, in other far less suitable situations—bases for instance, or even soffites of cornices, which are practically invisible in our climate—argues little apprehension of the most elementary motives which should influence such designs. Compare the Picton Reading Room with any of the neighbouring buildings, and it will be found to have an air of completeness and consistency which seems wanting in the others, and which its sculptured frieze may probably account for. The Walker Art Gallery (Sherlock and Vale, 1877) is more important for the fine collection of pictures and sculpture which it contains than for any special excellencies of its own design. It suffers, of course, from the difficulty which always besets attempts at providing a conventional exterior to an almost windowless building; but this, if not exactly conquered, is at least met as satisfactorily as in other recent buildings of the same class. With the neighbouring buildings it harmonises fairly well, and the galleries are convenient and well lighted. The remaining member of this group is the County Sessions House (F. & G. Holme, 1884), of which we give an illustration (see plates). Though agreeing in general proportions with the façades of the buildings just mentioned, the Sessions House presents the variety of a Roman "Composite" order, and it is treated with much less severity and reticence. Its materials contribute also to this difference of character, for the brown sandstone of the others is exchanged for limestone and granite. The interior is well arranged and dignified, the courts and offices opening from a central entrance hall with marble staircase and surrounding pillars. To the west of St. George's Hall, and considerably below it, in the centre of the garden (formerly a churchyard) which was the designated site in the abortive Liverpool Cathedral Competition, is an absolutely ugly pseudo-Gothic church of the last century, St. John's, the removal of which would certainly be no loss, although it is much to be hoped, for many reasons, that the proposed Cathedral, whenever it becomes an accomplished fact, will not be erected on this particular site. The last noticeable building in this neighbourhood is the North-Western Hotel (A. Waterhouse, R.A., 1871), a fine specimen of a terminus hotel masking a great glass-roofed station shed behind. Solidly built of a pleasant-coloured stone, with plenty of mass of material in the ground floor and at all the corners, and with good depth of reveal to the windows, it gives a much more favourable impression of the architect's powers than do many of the slighter-looking terra-cotta structures which are generally associated with his name. In size this hotel ranks with many public buildings, being over 300 ft. long and 80 ft. high to the cornice, with high roofs and towers above. Perhaps the best point about the design of the exterior is the somewhat uncommon but highly successful treatment of the two end elevations; these are flanked by corner towers having comparatively small openings and few strongly-marked horizontal lines, while the whole interval between them is occupied by successive ranges of closely-spaced windows, forming a sort of arcade on each floor. By this means enough of the very needful element of lightness is gained, and the nature of the internal arrangement sufficiently indicated, without, as is so frequently the case in large buildings composed of many low stories, breaking up and reducing the whole mass into a monotonous series of separate narrow layers, piled upon one another without the slightest organic relation.

Leaving the plateau on which all the buildings already mentioned are situated, and descending towards the river by Dale-street, the Municipal Offices (Weightman and Robson, 1860) are soon reached. This is a large block of buildings, isolated on three sides, of French Renaissance character, rather heavily treated, but having a fairly imposing general effect, so far as the exterior goes. In the principal front a too great fondness is shown for the vice so strongly condemned by Dr. Johnson, and grown much more prevalent since his day, of dragging in columns for pure ostentation, merely for the sake of having columns, evidenced by placing them out in positions where they cannot by any stretch of imagination be supposed to support, or even help to strengthen, any part of the building; but this was very likely due to having to win the favour of an amateur building committee, by whom a municipal building without a good show of Corinthian columns would probably be voted mean and shabby. The convex-outlined metal roofs with their florid cresting, suggestive of a large convervatory, somewhat mar the dignity of the building, while the tower, terminating in a lofty spire-like construction of stone, embellished with enormous crockets and with florid galleries and finials of ironwork, claims mention as a curiosity, rather than an ornament to the building. It might have the distinction of being unique, were it not that Sir Charles Barry designed something not unlike it for Halifax Town Hall, by which this may have been suggested. Inside it is rather a disappointment to find that the main entrance leads to no grand hall or staircase, but seems to lose itself in a ramification of dark passages, leading to various offices, by glass panels in the doors of which the passages are lighted. Several very ordinary-looking flights of stairs give communication with the upper floors, and the chief decorations of stairs and passages alike are dados of glazed tiles, coloured and grained in imitation of the patterns of various kinds of wood commonly used for parquetry floors! It has to be remembered, however, that these buildings are offices simply, and as such may well answer their purely utilitarian purposes, the ceremonial functions of

civic life being carried on in quite another building, the old Town Hall, instead of both being provided for in a single place, as is the case with most of the "Municipal Buildings" recently erected. Standing back to back with the municipal offices, and facing Victoria-street, is a well-built and expensive-looking, but utterly uninteresting, block of Government offices, comprising law courts, inland revenue office, and post-office, designed by the Office of Works, which is almost sufficient for an architectural description. The style is Italian Renaissance, very hardly and coldly treated, but every part of the building is overladen by a wasteful profusion of the most monotonous and mechanical "ornament" conceivable—work which cannot possibly have given either designer or executor a moment's interest or pleasure, and certainly cannot do so to any spectator. The absurd extravagance of these emanations from the Office of Works is a matter which might well be taken up by some reformer, for with half the money available much better buildings could be produced if the system on which they are turned out could be altered.

The most agreeable sight in this part of Victoria-street is the distant view of the Free Library and Picton Reading Room, standing up on the hill brow, well above the line of the street, across St. John's Churchyard, and having from this point a really imposing effect. There are on either side of the street several large recently-built newspaper offices and commercial buildings, fairly good in character, but hardly worth describing in detail, though among the former may be mentioned the offices of the *Courier* and of the *Daily Post and Echo*, both brick buildings, and as an example of the latter the red-brick group of shops and offices called "Jerome Buildings," marked by its original yet quiet treatment, especially noticeable in its red-tiled roofs with their large, plain dormers. Returning to Dale-street, at the corner of Sir Thomas-street, which separates it from the Municipal Buildings, is the Conservative Club, decidedly the best of the large Renaissance buildings in the city. It is built entirely of stone, and may be described as mainly Venetian in character, though with a French influence also perceptible. It looks, perhaps, a trifle over-windowed, but is still a dignified building, and one which appears as if well adapted to its purpose. A few doors further, on the same side of Dale-street, the Junior Reform Club (originally built as the Junior Conservative Club) presents a startling contrast. This is a red stone building, of a coarse and florid sort of "Manchester Gothic," sadly wanting in repose, more especially as the ground floor consists entirely of shop windows, the entrance being from a side street. The Reform Club, nearly opposite, is of very massive and simple character. It is constructed mainly of red brick, with very sparing use of ornament, except for a pillared porch of red granite; there are shops under it, in a sort of half-basement, but they are so arranged as not seriously to detract from the apparent solidity of the building. The most conspicuous buildings of the remaining portion of Dale-street, before the Town Hall is reached, are the Prudential Assurance Office (A. Waterhouse, R.A.) and the block of offices known as "The Temple." The former is a corner building, exhibiting some original treatment of the canted angle.

The materials are all red, granite, terra-cotta, brick, and tiles, and the general character of the design much resembles that of other buildings for the same Company. The Temple is an older building, of brown stone, and is distinguished by its central tower over the entrance; it is the subject of one of our sketches.

The Town Hall (Wood, of Bath, *circa* 1750) is very much the oldest, and still remains one of the most satisfactory of the important buildings of the city. Although several additions have been made to the original structure, the general effect is still that of a harmonious and well-balanced design; there is an entire absence either of prettiness or of aggressive, theatrical magnificence, and the whole building has an air of simple and quiet stateliness, to a degree uncommon enough to be exceedingly refreshing. One of our illustrations gives a general view of the exterior, showing especially the principal front to Castle-street. The advanced portico was added half a century after the main block was built, and the dome, which is surmounted by a colossal figure of Minerva (or Britannia, for the authorities differ on this point), about the same time. At the opposite side is another addition, not quite so well combined with the older work, and having an attic rising higher than the balustrade which crowns the rest of the building. In front of this attic, over the coupled columns of the northern portico, stand four statues representing the Four Seasons, sculptured by Westmacott in 1792. Internally, there is a fine and amply proportioned staircase, under the dome; and the suite of reception-rooms, though less "gorgeous" than those of some more modern town halls, will perhaps yield to none in England for general dignity and refinement of effect; the dining-room, with its segmental ceiling, is especially pleasing in appearance and proportion. Immediately behind the Town Hall, and forming with it the large quadrangle known as "The Flags," is the three-sided building of the Exchange (T. M. Wyatt, 1864). This is a large and much-ornamented building, French Renaissance, of a light and florid type in style, and characterised by an exuberant use of all the orders. Still the treatment is clever and not without refinement, and but for the ugly purple slate roofs with their high iron cresting, and for the excessive lightness of the arcades towards the quadrangle, might be called a satisfactory building. The arcades in question have stone and granite fronts and glass roofs, and there is so little masonry over their arches that they have exactly the effect of being the ground floor of an unfinished building. The straight façade to Chapel-

street at the other side of the building is much more simple, and is the best part of the building externally, though after all the immense news-room, which occupies nearly the whole of one of the wings, and is a hall 175 ft. long, 90 ft. wide, and 50 ft. high, with a dome 50 ft. in diameter rising in the centre, is perhaps its main feature, and gives it a distinct importance. The Exchange Station of the Lancashire and Yorkshire Railway, a short distance off, in Tithebarn-street, is the third of the great terminal stations of Liverpool, and has a long frontage, comprising shops on the ground floor and a hotel above; this, with its central block raised above the rest, and pierced by two large archways, with a projecting clock between, forms a thoroughly appropriate design, and is effective from a distance, but the details are coarse, and spoil it on a nearer view. Passing the Exchange again, and going down Chapel-street, several good blocks of offices are to be seen, especially Richmond Buildings on one side and Hargreaves Buildings on the other, both of Italian Renaissance design, the former showing chiefly Florentine influence, the latter, Venetian. These, and the "Temple" in Dale-street already mentioned, were the work of the late Sir James Picton, an old Liverpool architect who had rather a remarkable career, and after whom the "Picton Reading Room," which we believe he gave to the city, is called. Coming to the river front the most conspicuous object is St. Nicholas' Church, with a somewhat remarkable open-traceried spire, which, with the tower also, is fairly good modern Perpendicular Gothic, but the nave and aisles are of quite nondescript "Churchwarden" design. Many of the buildings facing the river are plain warehouses, but at the corner of Water-street is a rather imposing-looking block of four stories, with a bold cornice, and with part of the building carried up to a height which gives it its name of "Tower Buildings," and makes it almost as prominent as St. Nicholas' Church. The other buildings in Water-street can hardly be described except as large, dull, and sombre-looking; but in the parallel thoroughfare of Brunswick-street are several more interesting examples of street architecture. At its lower end, at the corner of Back Goree, is Nottingham Buildings, a simple but very pleasing and sensibly-treated piece of stone and red brickwork. Further up the street is the Corn Exchange (1854), with a very massive and handsome front of large brown stone ashlar. The building is of astylar design with quoined angles, and a large crowning cornice. The basement and ground floor are simply rusticated, with round arches to the ground floor windows, and a good Doric doorway. The first and second floors have square-headed windows without columns, but with moulded architraves. A very similar block, called Brunswick Buildings, harmoniously fills up the angle at the junction with Fenwick-street, and at the opposite corner the Liverpool Union Bank, a good solid-looking, but sufficiently windowed building, at present of light-coloured stone, but probably not long to remain so. On the same side of Fenwick-street is a two-storied addition, with a side entrance to the Bank of Liverpool, the main block and principal entrance of which are in Water-street. This little bit, which from an unfinished end appears like the beginning

BANK OF ENGLAND, LIVERPOOL.

of a rebuilding of the whole bank, is of quite recent erection, and is one of the most thoughtful-looking and interesting specimens of modern work we noticed. It is built entirely of grey granite, including even the balustrade which finishes it above the cornice, except the plinth and the jambs and lintel of the door, which are also of granite, but red. The lower and principal story has a row of large windows under boldly-moulded round arches, which have solid tympana bearing Celtic-looking interlacing patterns in low relief, carved in granite, and of different designs in each window. Above is a low upper story, treated as a continuous colonnade, formed by coupled pilasters with simply moulded caps of unusual but rational character, the whole space between them being occupied by windows. A well-designed cornice of but slight projection, and a plain balustrade, crowns the whole. The other end of Fenwick-street opens into Derby-square, with the Roman temple built for the National Provincial Bank of England at the corner. The centre of the square is occupied by the severely simple mass of St. George's Church, erected by the Corporation in 1825, and with Doric details, but singularly devoid of gracefulness. Looking from Derby-square up Castle-street, a vista effectively terminated by the portico and dome of the Town Hall, many of the most striking commercial buildings of Liverpool can be seen on one side or the other. On the right is the Bank of England (C. R. Cockerell, R.A.), a very characteristic example of his manner of design, and a most carefully-studied, if not perfectly pleasing, work. The sketch we reproduce shows its general effect, which gives any one seeing it for the first time the impression that it must be a Mansion House, or Lord Mayor's official residence, it has such a decidedly domestic yet stately aspect. The chief feature of the front is the Roman Doric portico of huge three-quarter columns, which stand out in front of the main wall to support nothing but a slight balustrade; the effect, seen from the corner, of the setting back of the upper part of the main wall with the pediment, while the columns and entablature project in front of it, is rather curious. On the same side of the street the Marine Insurance Office (Grayson & Ould) will attract attention; it is a six-storied building of red granite, stone, and red brick, with a high roof of green slates, and has, running between the windows of the first and second floors, a mosaic band, representing various sorts of shipping, thrown up by a gold background. Across the street the most noticeable buildings are the banks at the two angles made by Brunswick-street. The Adelphi Bank (W. D. Caröe, 1891) is among our lithograph illustrations, but the coloured materials which contribute so much to its effect require separate mention. The plinth and lower part of the walls up to the window sills are of a variegated red and grey granite, looking at a little distance a rich

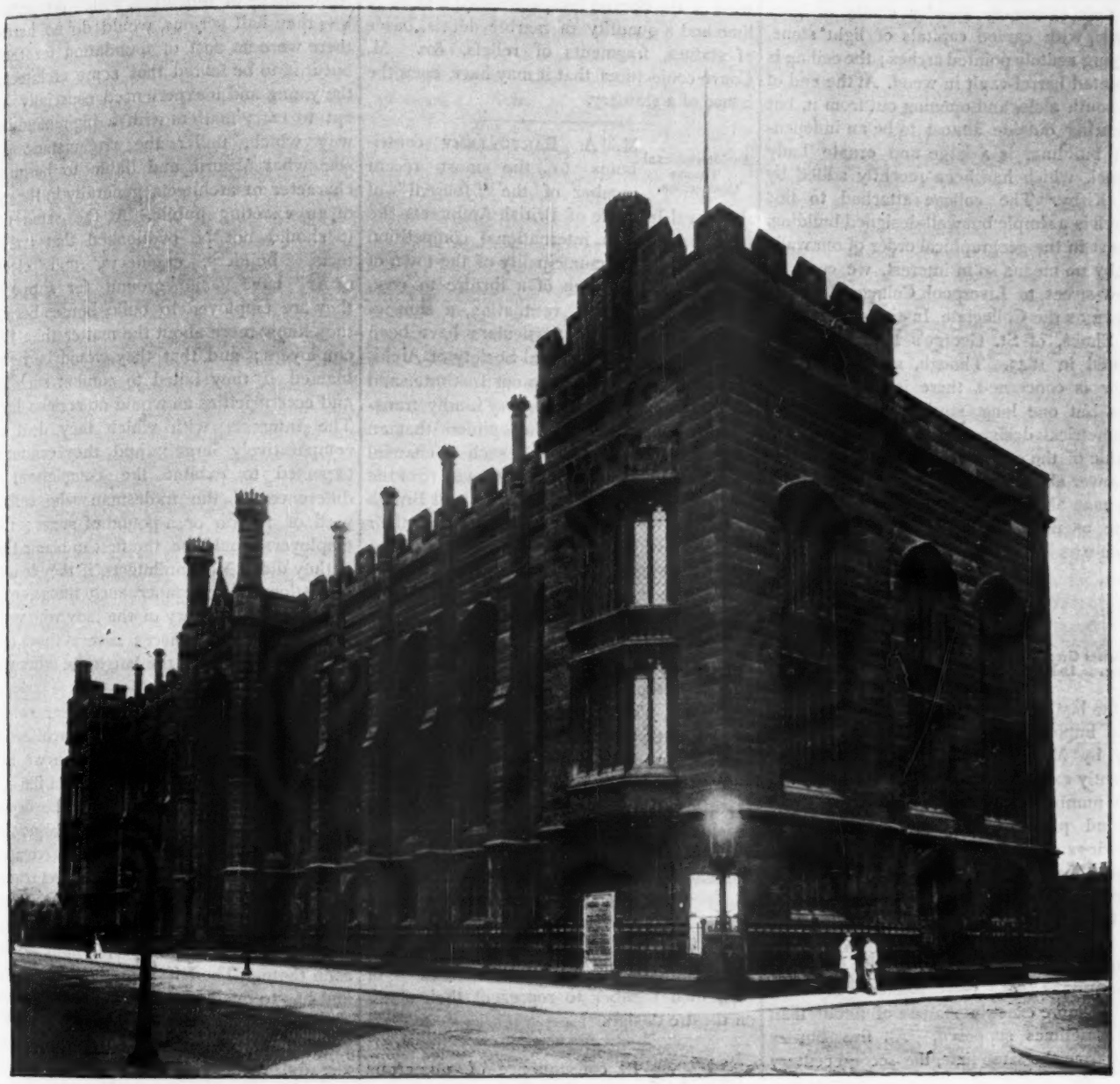
brown, and harmonising excellently with the red sandstone of the ground floor; the upper part is of a lighter stone, and the roofs of red tiles, with a little copper-work on the angle-turret; both fronts are very rich all over with tasteful and carefully executed detail, but in spite of the good quality of the work, it may be questioned whether the building would not have gained as a whole by greater concentration and reticence. In Leyland and Bullins' Bank (Grayson and Ould) just opposite, though the general effect from a distance is good, the detail suffers by comparison with that of its neighbour, and the choice of materials, pink granite for the plinth and white stone for all the rest, is certainly not so happy. The side elevation, with its high gable facing Brunswick street, a very welcome relief among so many long level cornices, is the best feature of the building. Next the Adelphi Bank, on the other side, a common type of French Renaissance design is exemplified in the Victoria Chambers, a big block treated discreetly but without imagination, and without special merits or defects; red granite is used here for both of the lower floors and a grey stone above. Not far from here a good specimen of a commercial building, with some originality in design, may be seen in the Central Buildings in North John-street. This is a large four-storied building, massive in general appearance, the ground floor of which has a range of sturdy Doric columns, with shafts of red granite, springing straight up from the pavement; the whole space from ground to architrave is glazed, but entirely behind the line of the colonnade; the columns really carry the upper part of the building, and the effect of this unusual arrangement is distinctly good. Coming into James-street, which leads again down to the river, the station of the Mersey Tunnel Railway (Grayson and Ould) is very conspicuous, with its high tower. It is built entirely of red sandstone, in a style which might be called Romanesque refined; both round arches and lintels are employed; the windows have deep reveals, and there is no lack of solidity. At the bottom of James-street, at the corner of Back Goree, a somewhat remarkable building, differing in character from any of its neighbours, is being erected for the White Star Steamship Company. It is still surrounded by scaffolding, and the upper part unfinished; but from what is visible it looks almost as if a replica of the London police headquarters at New Scotland yard was contemplated; the flat granite work of the lower stories, the red brick and white stone bands and dressings of the upper ones, the heavily rusticated entrance archway, the corbelled-out circular angle-turret, all are there; nothing yet, however, is there to show how the sky-line is to be treated, and it is impossible to estimate the merits of the building in its present state. Following the river front the immense pile called the Revenue Buildings (Foster, 1830), standing in the midst of a large open space, where it can be well seen from every direction, is soon reached. This building, designed to include the Custom House, the Inland Revenue Office, the Post Office, and the offices of the Docks and Harbour Board, is H shaped in plan, and on a grand scale, being about 470 ft. long, and having octastyle porticos on three fronts, with a high dome in the centre. It is Greek Ionic in style, carried out with a fair amount of correctness in detail, though with a general aspect of severity and heaviness rather foreign to the true nature of the style. Characteristic of an architectural fashion now very much discredited, and almost entirely destitute of anything which can be called ornament, this building, with its single great order of columns and pilasters, and almost defiant sternness of treatment, depending for effect solely on the distribution of its large, simple masses, comes in nowadays for a good deal of adverse criticism and very little admiration: nevertheless it is a grand and dignified building, and shows real greatness of mind on the part of its designer. Facing the same open space is the Sailors' Home, a tall building of red sandstone of Elizabethan type, too tall for really satisfactory proportions, but fairly pleasant-looking, and said to

be convenient and well-arranged. Near this is the warehouse front in Paradise-street (E. Kirby) of part of which we give a sketch; it illustrates among other points the effect of the long recessed hoisting space or shaft, a characteristic of Liverpool warehouse buildings.

Although Liverpool is a bishop's see, no mention has yet been made of the cathedral church, for the reason that the present official "cathedral" is an ordinary parish church, with no architectural pretensions to pre-eminence over the others. Continuing our survey, however, along the great business thoroughfares of Lord-street and Church-street, which, though possessing many good shops, have no special points of interest, we come to St. Peter's Church, now the cathedral, in a not particularly good position, standing parallel to Church-street. St. Peter's (1704) is the oldest of the Liverpool churches, and a good, typical specimen of an ordinary town church of the age when it was built; inside it is fairly rich in characteristic woodwork, now quite dark-coloured, in galleries, panelling, and other fittings. Just behind the church in School-lane is a pleasant, homely-looking building of nearly the same age, the Blue Coat Hospital (1726). It forms three sides of a quadrangle, the front being occupied by high gate-piers and good iron railings; it has several doorways, each reached by steep flights of steps; the windows are round-headed and filled in with broad-barred sashes; the walling is of dark red brickwork and the dressings and quoins of stone painted white; there is much about it which brings back recollections of Holland, and it is certainly one of the most picturesque things in the city. A little further up Church-street, at its junction with Parker-street, is a striking block of shops and offices recently built from the designs of the present City Surveyor, Mr. Shelmerdine, of a part of which a sketch is given; the materials are buff and red terra-cotta, and the roofs covered with red tiles, the latter being somewhat rare in Liverpool. In a rather out-of-the-way corner, not far from here, but where it cannot be much seen, the Corporation have prepared a pleasant surprise in their Gas and Meter-testing Station (1894). This is a small building, but a really artistic one, and alike in materials, general design, and special adaption to its peculiar and somewhat difficult site, it leaves a most satisfactory impression, and a feeling that municipal architecture may be after all on an uphill road. Of another Corporation building, St. John's Market, also by the City Surveyor, we give a sketch of the front, showing the main entrance. This part of the market is a solid looking structure of stone and granite, with steep tiled roofs; the market-sheds stretch out for a long distance behind.

Facing Ranelagh-street is the Central Station, the joint terminus of the Midland, the Great Northern, and the Manchester, Sheffield, and Lincolnshire Railways. The station itself is a fine one, and there is a booking-hall of grand dimensions, but the street front, though substantially built of Ancaster stone and Aberdeen granite, has nothing remarkable about it. Close by, at the beginning of Bold-street, is the Lyceum (1802), a literary institution, containing a news-room and library, and having a strictly Roman Ionic exterior. Further up Bold-street, on the same side, is the Palatine Club, built in 1854 from the designs of Parnell, the architect of the Army and Navy Club in Pall Mall; an unpretending building, somewhat difficult to get a view of on account of the narrowness of the street, but, nevertheless, very well worth close attention. It is a four-story corner building, the style of which might be described as Italian Renaissance, with reminiscences of both the Florentine and Venetian manners; but its special charm is in the arrangement of the stories, the grouping of the windows, and the refinement, without weakness, of all the details. If its interior arrangement is at all commensurate with the grace of its exterior, it must be a model club-house; but in any case it might vie with any club in Pall Mall or Piccadilly for the skill displayed in its design; and every part seems to be so thoughtfully studied that it would be equally difficult to suggest what might be added or what taken away if improvement were desired.

In Bold-street there is nothing else to notice, except, perhaps, the Savings Bank—quiet, simple, and substantial—until St. Luke's Church (Foster, 1831), one of the four Corporation churches, very effectively placed at the upper end of the street, at a



From a photograph by Brown, Barnes, & Bell, Liverpool.

LIVERPOOL COLLEGE: DESIGNED BY ELMES.

corner where several streets converge. The large turreted tower at the west end is seen all along Bold-street, and stands so high above the roadway that there is an ascent to the doors of several broad flights of steps. The chancel is of very unusual size for its date, and has four bays and an apse besides. The style of the church is a free mixture of all Gothic precedents, and the interior is of no particular interest. Going on eastward from St. Luke's, the next noticeable building is the Philharmonic Hall (Cunningham, 1849), at the junction of Myrtle and Hope Streets. Though of chief importance for its interior, and justly celebrated for its excellent acoustic properties and general suitability to its purpose, the external effect of the hall is by no means unsatisfactory. A rectangular building of dark brown stone, it is simply and severely treated, and recalls the aspect of a Florentine palace. It is of two stories, the lower having arched openings with flat pilasters between, and the upper plain oblong windows with pediments, the whole being surmounted by a deep and widely-projecting console cornice, from which the roof rises directly without being hidden by attic or parapet.

A little further along Hope-street is the large Unitarian Chapel, designed by Raffles Brown for Dr. James Martineau in 1849. This has a lofty tower and spire, and is altogether an unusually successful specimen of the Gothic revival, the general proportions being good, the detail passable, and the materials appropriately handled. Facing the Philharmonic Hall, in Myrtle-street, is a cheerful-looking and picturesque hospital, the Eye and Ear Infirmary (Ellison, 1878), of red brick, with stone dressings, treated in thoroughly domestic fashion. At the junction of Hope-street with Mount Pleasant the rounded angle is filled by the circular hall of the Medical Institute, with its rather curious portico, formed by recessing one quadrant of the building, and carrying the entablature round on six Greek Ionic columns; the general effect unfortunately rather gloomy. Further down Mount Pleasant the front of the Wellington Rooms affords a direct imitation of Roman architecture; here a tolerably close copy of the temple of the Sibyls at Tivoli, with its columns engaged instead of standing free, is made to do duty as a central porch, with blank wings adorned with pilasters to correspond thrown out on either side.

Passing by the Workhouse, big but uninteresting, a large space extending from Brownlow-hill to Pembroke-place is occupied by the various blocks of buildings, still being added to, which compose University College and the Royal Infirmary, of which we give a view from a drawing by Mr. Brewer (see lithograph). These institutions are in close connexion, and have been entirely built, or re-built, within the last few years by Mr. Alfred Waterhouse, and so possess a general uniformity of character. Red terra-cotta for dressings, and the local brownish-grey brick for walling, are everywhere used. The most prominent features of the buildings are the tall Jubilee Clock Tower over the main entrance to the College, the polygonal lecture theatre of the Medical School, and the two great circular wards of the Infirmary. A little way further north, and standing conspicuously at a corner of Salisbury-street, is the Jesuit Church of S. Francis Xavier, one of the best modern churches in the city. Early Gothic in general character, of a more refined type than that usually favoured in Roman Catholic churches, it has a somewhat remarkable interior: the nave is of eight bays, and the arcades are peculiarly graceful, consisting of

tall and extremely slender shafts of grey marble, with carved capitals of light stone, carrying acutely pointed arches; the ceiling is a pointed barrel-vault in wood. At the end of the south aisle, and opening out from it, but appearing outside almost to be an independent building, is a large and ornate Lady Chapel, which has been recently added by Mr. Kirby. The college attached to this church is a simple but well-designed building.

Last in the geographical order of our walk, but by no means so in interest, we come in Shaw-street to Liverpool College (formerly known as the Collegiate Institute), designed by Elmes, of St. George's Hall fame, and opened in 1843. Though, so far as its exterior is concerned, there is nothing to be seen but one long, straight front of rigidly symmetrical design, and in the formal late Gothic of the early revival, there is a quality of power about it which stamps it as the work of a man above the common run, and shows, quite as much as his larger building, how much was lost by Elmes's early death.*

NOTES.

Ancient Greek Houses in Delos.

THE new number of the "Bulletin of the French School" (which treads hard on the heels of the last) has several articles of architectural importance, but chief among them is one by M. Couve on the private houses recently excavated in Delos. These houses now number five, and of all M. Couve gives ground plans, with enlarged plans and drawings of many details. The article itself should be read by all those interested in Greek domestic architecture, and specially by those concerned in defending the accuracy of the statements of Vitruvius, as M. Couve's general conclusion is that the descriptions of the Roman architect are far more exact in matters of detail than is sometimes supposed. All five houses date from the same time, the second century B.C., the period of Athenian occupation, a time also of great commercial prosperity, and from all the appointments that remain they were evidently occupied by persons of wealth and position. Architectural considerations which led to the fixing of this date have happily been confirmed by the discovery of about thirty Athenian tetradrachms, which, from the magistrates' names inscribed on them, fall into two series, the one dating from 186-147, the other from 146-87 B.C. Houses and coins alike were anterior to the destruction of the island by Archelaos in 86 B.C. M. Couve characterises the houses generally as rather Greek than Græco-Roman, *i.e.*, if we accept as the distinguishing characteristics of the Roman house the atrium and impluvium, and of the Greek house the peristyle. They are all houses of the peristyle type, with the ground floor rooms grouped round an open court. In more than one of the houses there was undoubtedly a second story, as the places for fixing the staircase have been found; the wooden staircase has, of course, perished. The court and principal reception rooms are paved with mosaics and decorated with mural frescoes, the private and sleeping rooms are very small and left absolutely plain. Each house is carefully provided with cisterns for the collecting of rain-water, wells being scarce in Delos. One of the houses, that to the west of the Sacred lake, contained a store of lime and a quantity of marble débris, bases of statues, fragments of reliefs, &c. M. Couve conjectures that it may have been the house of a statuary.

* The next of this series of articles, on the Architecture of Manchester, will appear in our issue for November 7.

An International Theatre Competition.

M. A. BARTHÉLEMY contributes to the most recent number of the "Journal" of the Royal Institute of British Architects the particulars of an international competition promoted by the municipality of the town of Kieff for the erection of a theatre to cost, without heating and ventilation, a sum of about 48,000*l*. The particulars have been forwarded by the Imperial Society of Architects of St. Petersburg to our Institute, and M. Barthélemy, who has very kindly translated them, expresses the opinion that an invitation coming through such a channel should be fully responded to. Clause 18 of the particulars is, however, likely to lead British architects to pause before spending their time in the way proposed to them. This clause states that the designs selected for awards —of which there are to be five—will become the property of the promoters, who further categorically reserve to themselves the right —"(*a*) To choose from amongst the premiated designs either any one, *or any part of any one*, which they may deem desirable. (*b*) To employ to carry out the work either the author of the design, or any other person, and to pay such person accordingly." Is this what the St. Petersburg Institute considers a fair condition, or has it been treated by Kieff as our own Institute was treated by Belfast? Some people, too, might think that if British architects were to be specially invited to compete, as M. Barthélemy says they are, room might have been found on the jury of seven for one of their own number to represent their views on theatre design.

Projected Improvements at the Tuileries.

IN consequence of numerous petitions and complaints as to the public inconvenience caused by the insufficient size of the archways between the Place au Carrousel and the Rue de Rivoli, the Municipal Administration of Paris has addressed a memorial on the subject to the Minister of Public Works, requesting that these entries may be enlarged to the same size as the vaulted entrances under the Louvre buildings, on the side next the river. This improvement was in fact projected in the Second Empire, and since the opening of the Avenue de l'Opéra has become almost imperative. The expense, of which the municipality offers to pay half, would not be very great, nor would the alteration be any injury to the architectural effect of the Tuileries façade.

Architect and Employer.

NOT long ago an amusing article appeared in the *Pall Mall Gazette*, among "The Wares of Autolycus," in which were described the difficulties experienced by people who wish to carry out their own ideas in their own houses. To overcome the unanimous opposition of "architects, builders, engineers, and electricians" in such cases was said to need almost superhuman energy and strength of will; so intent were these unreasonable people upon having their own way, in utter disregard of the wishes of the employers who paid for the houses and had to live in them! Accusations of this kind, which are perhaps less than half serious, would do no harm if there were no sort of foundation for them but it is to be feared that some architects—the young and inexperienced especially—are apt to carry matters with a high hand in a way which, under the circumstances, is somewhat absurd, and liable to harm the character of architects generally in the eyes of an exacting public. At the same time it should not be overlooked that "architects, builders, engineers, and electricians" have some ground for supposing they are employed to build houses because they know more about the matter than their employers; and that they would be rightly blamed if they failed to combat such fads and eccentricities as would do serious harm. The interests with which they deal are comparatively large; and they cannot be expected to exhibit the complaisant indifference of the tradesman who sells a yard of ribbon or a pound of sugar; their employers would be the first to blame them if they did. Most architects, if they had the unwisdom to remember such things, could cap Autolycus's story of the lady who would have no chimney-pieces several times over, and effectually turn the laugh the other way.

Charges for Competition Instructions.

WE print in another column a letter from an architect on this subject, to which we have before referred. The unfairness of the now frequent procedure of exacting the deposit of a guinea (or sometimes a larger fee) before sending the conditions of a competition lies in this, that an architect cannot even tell whether the competition is worth his going in for, or whether the conditions are such as he could accept, until he has seen them. Then if he finds they are not, and has to decide not to compete, he loses his deposit. Architects are surely robbed enough in connexion with competitions already, without this additional tax being placed upon their efforts. If a considerable proportion of architects would agree not to compete or send for the instructions unless they have them free of charge, the practice would soon be stopped. Committees have no right to complain that they have to throw away a certain number of copies of the instructions without getting a design; it is simply a small expense incidental to a competition, which they ought not to grudge.

The Fountain in Hyde Park.

THE new fountain in Hyde Park, not far from the eastern end of the Serpentine, of which Mr. W. R. Colton is the sculptor, is a welcome addition to our very small list of public ornaments of this kind which have any art or originality about them. It consists of a wide flat stone basin, supported on a square pillar or stem, and rising from the centre of the basin is a nude torso of a nymph, who holds under each arm a fish the mouth of which forms the water-spout, the two fish being reversed, however, so as to discharge into the opposite sides of the basin. The basin and support are treated in a very free manner, a certain amount of ornamental modelling being given to them, but in a very broad and half-defined manner which is not ineffective, though perhaps it has a little too much of an unfinished look. But the point in the design is the head of the nymph, which is full of character and as unlike as possible to the commonplaces one

is accustomed to in English outdoor sculpture of this kind; a kind of thing one would expect to find in the Tuileries Gardens rather than in a London park. Let us hope that official taste and perception in this country are improving, and that we shall by degrees see more sculpture and less stone-cutting in our parks and gardens.

Downing-street.

ACCORDING to the Report of the Select Committee upon Government Offices (Appropriation of Sites) it seems that the house, No. 10, in Downing-street, so long the official residence of the First Lord of the Treasury, is marked for demolition. It has a large stone-paved entrance-hall; from the passage leading to the dining-room, a double-door opens into the Cabinet Council room, which overlooks the Horse Guards parade ground. The street—once longer than it is now—is named after Sir George Downing who, having served under Cromwell, was appointed Secretary to the Treasury (in commission) in 1667. In the following reign the property passed to Lord Lichfield, Master of the Horse to James II. On his attainder it reverted to the Crown. King George I. gave Sir Robert Walpole's house to Baron Bothmar, the Hanoverian Minister, for life. In 1735 Walpole removed hither from St. James's-square, for his official residence, having stipulated that it should henceforth be annexed to the post of First Lord of the Treasury. Other houses in the street were subsequently taken for the Colonial Office (where Nelson met Wellington for the only time), the Foreign Office, the Judge Advocate, and the Chancellor of the Exchequer. Lord Chatham was carried thither in a dying condition from the House of Lords, and at No. 10 the first Lord Iddesleigh was seized with the sudden illness which speedily resulted in his death. Smollett practised as a surgeon in Downing-street in 1745-6; and there lived Aubrey de Vere, twentieth and last Earl of Oxford; John Boyle, Earl of Orrery; Boswell; and Lord Sheffield, friend of Gibbon. We have seen the historian's card-plate, inscribed "Lord Sheffield's, Downing-square." The south side of the street was taken down seventy years ago; at the King-street corner stood a noted tavern with the sign of the "Cat and Bagpipes."

An Insanitary Cornish Village.

FROM Dr. Sweeting's report to the Local Government Board on the prevalence of diphtheria in the Ludgvan Urban District (near Penzance), it appears that Ludgvan consists of various clusters of cottages, some formed of a combination of clay and straw, locally termed "cob." The water supply is obtained exclusively from local springs, the water of which is rendered available either at roadside dipping-places, or by being partially piped to roadside spouts. The dipping-places, besides being difficult of access—especially at New Town, where the cottagers have in one case to go about 500 yards for water—are exposed to various kinds of contamination, as by road surface washings and animal pollutions. There is an entire absence of proper drainage in the district, except at a few private better-class houses, which are drained into cesspools. Slops are therefore thrown on to the ground around the cottages, where they form pools, often in close contiguity to the walls and foundations, or into rude holes in the ground, which receive also animal and vegetable refuse. Until recently, excrement was disposed of entirely in cesspits of primitive village pattern, consisting of rude holes dug in the ground loosely covered by boards. Some of these still survive, though of late they have been, in many instances, replaced by better constructed privies placed in galvanised iron sheds and well removed from buildings. Sanitary administration however, is practically non-existent in Ludgvan. The minute book of the District Council, kept by the clerk (who is also the village blacksmith), contains no record of any systematic attempt at sanitary organisation or improvement of the district, and no regular report, whether monthly, quarterly, or annual, is asked for from the Medical Officer of Health. Result: a bad outbreak of diphtheria last summer. The authorities may perhaps learn by experience that prevention is better (and often easier) than cure.

The Tomb of Pasteur.

THE carrying out of the monumental tomb to Pasteur, at the Institute founded by him in Rue Dutot, is in active progress, and has got so far that we can now judge of its general arrangement and effect. A large underground passage leads to a dimly-lighted crypt in the middle of which the tomb is placed. The light is obtained from small windows above an altar which stands at one end. The walls are ornamented with columns of black marble, with plaques of ceramic ware recording, in inscriptions and designs, Pasteur's chief discoveries and the services he rendered to humanity. The sepulchre will probably be completed about the end of the year.

University and King's Colleges.

WE have received the programmes of the course of instruction in architecture at these two colleges for the ensuing session. University College, under Professor Roger Smith, includes in its syllabus two courses of lectures on Architecture: Course A on Architecture as a Fine Art (treated historically); and Course B on Architecture as a Science. There are also to be some additional lectures on architectural drawing and Building Construction, and on Quantity Surveying; these are introduced in pursuance of a grant made by the Carpenters' Company with that object. Professor Roger Smith's Introductory lecture, to which (as usual) admission is free, will be given on Tuesday, October 6. At King's College, under Professor Banister Fletcher, the term commences on October 5, divided into First year work—nature of building materials and elementary construction; Second year work—further studies in construction and materials; and Third year work—the History of Architecture, the latter subject being divided so as to fall in with the requirements of the Royal Institute of British Architects' Examinations. The architectural studio is open every day except Saturday, which is devoted to outdoor measuring and sketching, &c.

Gas Exhibition, New York.

A LARGE Gas Exhibition, or "Exposition" as the Americans prefer to call it, is to be opened in New York on January 25, 1897, in the hall in Madison Square Garden. It is to include gas appliances of every description, together with "demonstrations" of gas cooking, and ought to be an exhibition of considerable interest and value. Applications for space can be made up to October 15. Mr. L. J. Montgomery is the Secretary.

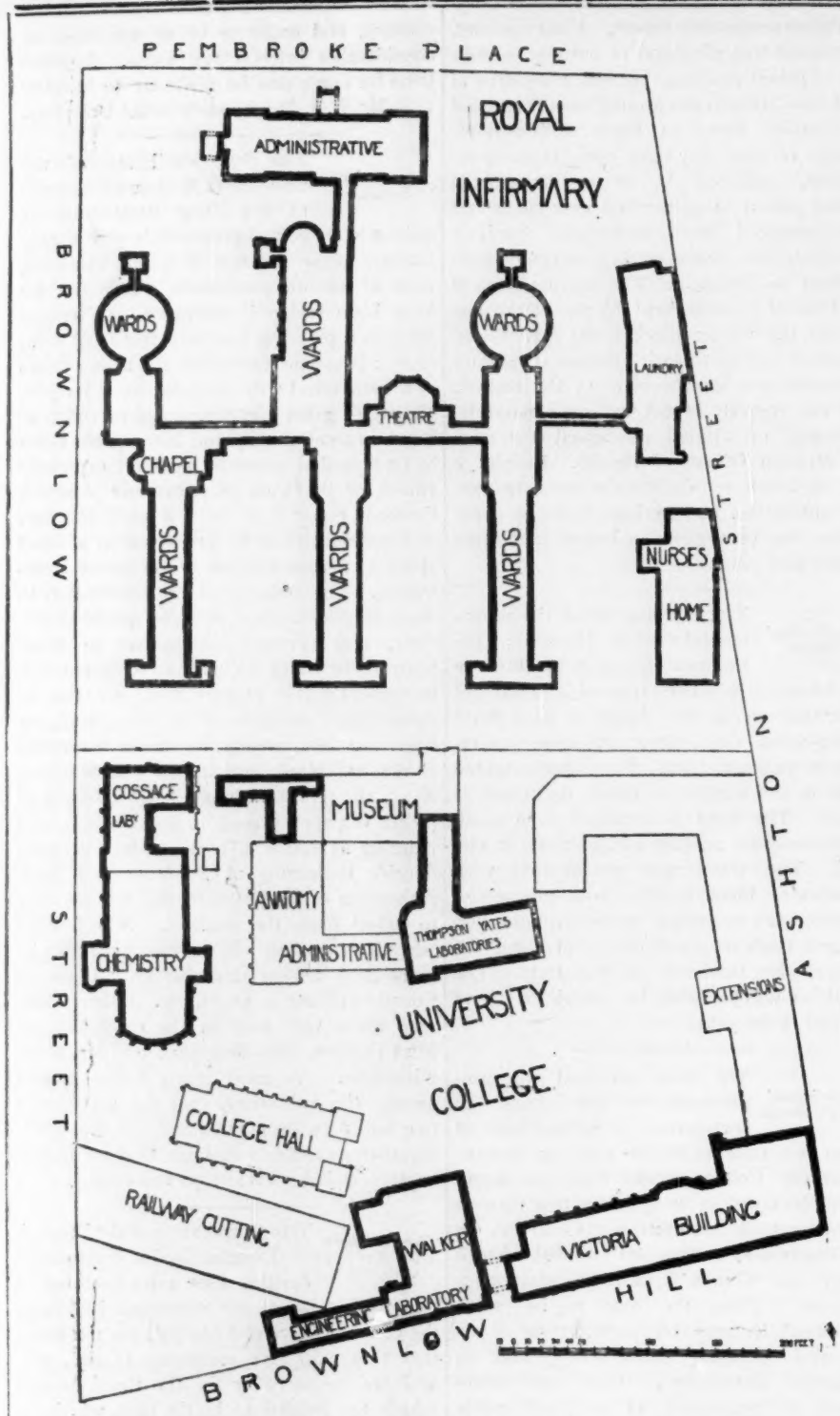
The Miniature Exhibition.

THE first exhibition of the "Society of Miniature Painters," at 175 New Bond-street, is quite a success, and promises to give a new impulse to the practice of a very charming form of artistic production, which has for long been rather in abeyance. Of course miniature painting is a very restricted form of art; it cannot pretend to the higher forms of artistic effect; its strength lies in its possibility of great minuteness and precision of finish in small detail, and hence it has come to be regarded naturally as an art especially suited for that kind of portraiture in which the main object is to have a good likeness, and one which can be preserved in a small space as a memorandum of the person pourtrayed. The majority of the contributors to the exhibition appear to have accepted this view, and confined themselves to small portraits in which accuracy of representation is evidently the object; there are two or three figure subjects of an ideal kind, but they are not among the most successful works exhibited, and in the classic scene, No. 3, the representation of the columns on pieces of paper placed in front of the real painting is rather a trick. There is considerable uniformity of excellence in a large proportion of the portraits, and it is not easy to select from the number. Miss Lewis's portrait of a little child (Case 2 *m*) may be mentioned among those which are exceptionally delicate in execution. Other artists who show very well in the exhibition are Miss Hobson, Miss Behenna, and Mr. Hugh Nicholson. A good many ladies' names among the exhibitors, and the presence of two ladies on the council, indicate that this is regarded as rather a suitable field for female artists—as indeed it always has been.

Douglas Municipal Buildings Competition.

THE Corporation of the Borough of Douglas invite competition designs (see advertisement in this week's issue) for municipal buildings, the cost not to exceed 10,000*l.*, on the terms that they will give premiums of 40*l.*, 20*l.*, and 10*l.* respectively for the three designs which are judged to be the best, which designs are to be the absolute property of the Corporation, "to adopt in whole or in part as the Corporation may deem necessary or desirable, without further payment to the successful competitors." This is at all events put with commendable clearness and precision. The architect's fee, on the ordinary terms, for designing and carrying out a building of that size would be 500*l.*, or for plans only without supervision, 250*l.* The Corporation invite the architectural profession to present them with this value of work for the sum of 40*l.* "Surely in vain the net is spread in the sight of any bird."

CONGREGATIONAL CHURCH, BITTERNE.—The memorial stone of this church was laid on the 16th inst. The main building is to be of a plain, substantial character, 55 ft. by 28 ft., and there will be in addition two small transepts, each about 20 ft. by 7 ft. Externally it is to be faced with red bricks, and will have a slated roof. The arches and pilasters in the interior are of brick and the walls will be plastered. The latter are to have a dado of pitch pine, some 4 ft. in height, and the whole of the internal joinery will correspond. At the rear of the building there is to be a small vestry with offices. The architects are Messrs. Mitchell, Son, & Gutteridge, of Portland-street, Southampton.



Buildings of the Liverpool University and Royal Infirmary. Block Plan.

Illustrations.

ST. GEORGE'S HALL, LIVERPOOL.

IN devoting our illustrations this week to Liverpool buildings, we have thought it worth while to have a special drawing made of St. George's Hall, a celebrated building which has not, as far as we know, been very much illustrated except in small engravings and by photographs; and it is impossible to get any photograph to give the perspective effect truly, and to seat it, so to speak, properly on the ground. The plate is a reproduction from a washed Indian Ink drawing made on the spot by Mr. W. Monk, expressly for this journal.

The Hall, as every one knows, was designed by Elmes, the youthful genius whose early death was such a loss to architecture in this country. Some further remarks on the building will be found in our leading article.

The view shows in the distance a portion of the group of Classic buildings formed by the Public Library, Picton Reading-Room, and Walker Art-Gallery, which combines so well with St. George's Hall; also the Wellington column, the counterpart of the Nelson column in London; not a happy addition to the general effect, but erected at a time when it was thought that the happiest way of showing honour to a great man was to erect a column and call it after his name.

LIVERPOOL UNIVERSITY COLLEGE AND ROYAL INFIRMARY.

THE accompanying bird's-eye view of the Liverpool University College and Royal Infirmary, from a drawing by Mr. Brewer, is taken from the south-east, at the junction of Ashton-street and Brownlow-hill.

To the right of the Victoria clock tower of the College are to be seen, in the distance, the parallel lines of the Infirmary, with its two circular wards and the Administrators' block between them, but farther from the spectator. This building has been now erected for some years. Dover-street (now closed) divides the Infirmary grounds from the College.

The oldest part of the College is the Chemical laboratory facing Brownlow-street. This is the farthest block in the view to the left of the tower. It is now receiving a most important addition to the north, due to the liberality of Mr. F. H. Gossage and Mr. T. Sutton Timmis. On the other side of the College Quadrangle, right of the tower, are the Thompson Yates (Physiological) laboratories, also in course of erection. These latter are due, as their name implies, to the liberality of Mr. Thompson Yates.

Of the buildings facing Brownlow-hill, those most to the left are the Engineering laboratories, the gift of Sir Andrew B. Walker, Bart. Next to them, between the Archway and the Tower, are the Tate buildings, the gift of Mr. Henry Tate, containing on the upper floor the College Library, upwards of 100 ft. long and 50 ft. long, and, on the floors below, the Senate-room, Lecture-rooms, Professors' rooms, &c.

The entrance under the tower leads into a reception hall, with spacious staircase and upper gallery or corridors forming an architectural whole, and all lined with faience. The staircase conducts to the library on one hand, and to the semi-circular theatre on the other, the position of which is clear from the drawing. Students' rooms occupy the stories below the theatre.

A commencement has been made in connexion with the re-building of the Medical schools in the space behind the tower, between the Gossage and Thompson Yates' laboratories.

The only buildings shown on the drawing which are not yet undertaken are the Examination Hall, parallel to the railway (between Engineering and Chemistry), the block of buildings at the north-east corner of the site surrounding the grove of trees on the drawing, and the rest of the Medical School buildings.

Both Infirmary and College are uniform in style, of local brick, faced with Ruabon terra cotta.

The architect is Mr. A. Waterhouse, R.A., who has, since 1891, associated Mr. Paul Waterhouse with his works, under the title of "A. Waterhouse & Son."

THE ADELPHI BANK, LIVERPOOL.

A GEOMETRICAL drawing of this building—then in course of construction—was hung in the Royal Academy Exhibition of 1890, and was reviewed in these columns. The drawing now reproduced was hung in this year's Academy, and was made from the building by Mr. Begg.

The Bank stands at the corner of Castle-street and Brunswick-street.

The plinth is of Hill o' Fare granite, the ground story of Corsehill stone, and the upper stories of Ketton, interspersed with broad bands of Corsehill at each floor level, red tiles being used to complete the colour effect.

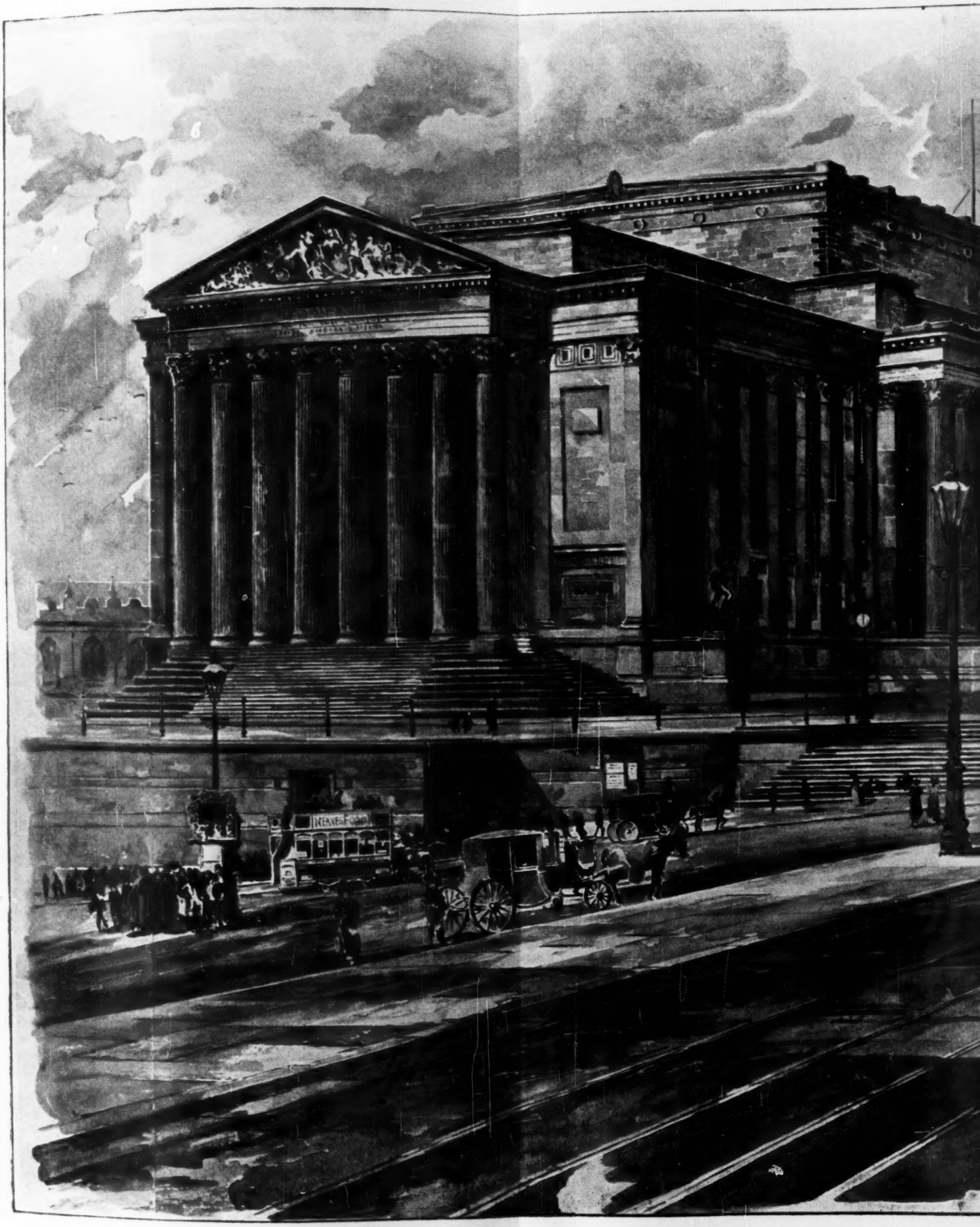
The interior of the Bank is lined with Pavonazzo and Verona marbles, treated very simply in panels, patterns being formed by the reversed natural veining of the marble slabs.

LIVERPOOL TOWN HALL.

THE illustration of this building is from a photograph made expressly for the *Builder*. The Town Hall which was completed and opened in 1754, was designed by the architect known to history as "Wood of Bath," and who was largely instrumental in giving to eighteenth century Bath its special and almost unique character.

The front shown is the principal entrance front facing towards Castle-street. In the rear of the building is the open-air exchange known as "The Flags," a quadrangle now surrounded by the building erected by T. H. Wyatt, in 1864, but which was formerly surrounded by a quadrangle of lower height and more simple design, of the same date as the Town Hall or thereabouts (whether also designed by Wood we are not sure). They were very plain buildings with little ornament beyond the usual Classic window-dressings, and a colonnaded centre opposite the centre of the Town Hall, and with an open arcade on the ground story of short massive rusticated piers and round arches; the arcade being under the upper portion of the building, and not a projection in front of it. The removal of these buildings was a practical necessity on account of the offices contained in them not furnishing either the accommodation or the lighting required in the cotton-broking business for which they were mainly required; but architecturally their removal was a matter for regret, for they harmonised much better with the Town Hall, both in regard to scale and architectural style, than the more ornate quadrangle which replaced them. Indeed, the Town Hall along with its old quadrangle presented an architectural combination of remarkable unity and completeness, and such as is not often met with in city architecture.

LMES.



ST. GEORGE'S HALL, LIVERPOOL.—DESIGNED BY

DESIGNED BY ELMES.

BUILDINGS OF THE LIVERPOOL UNIVERSITY AND

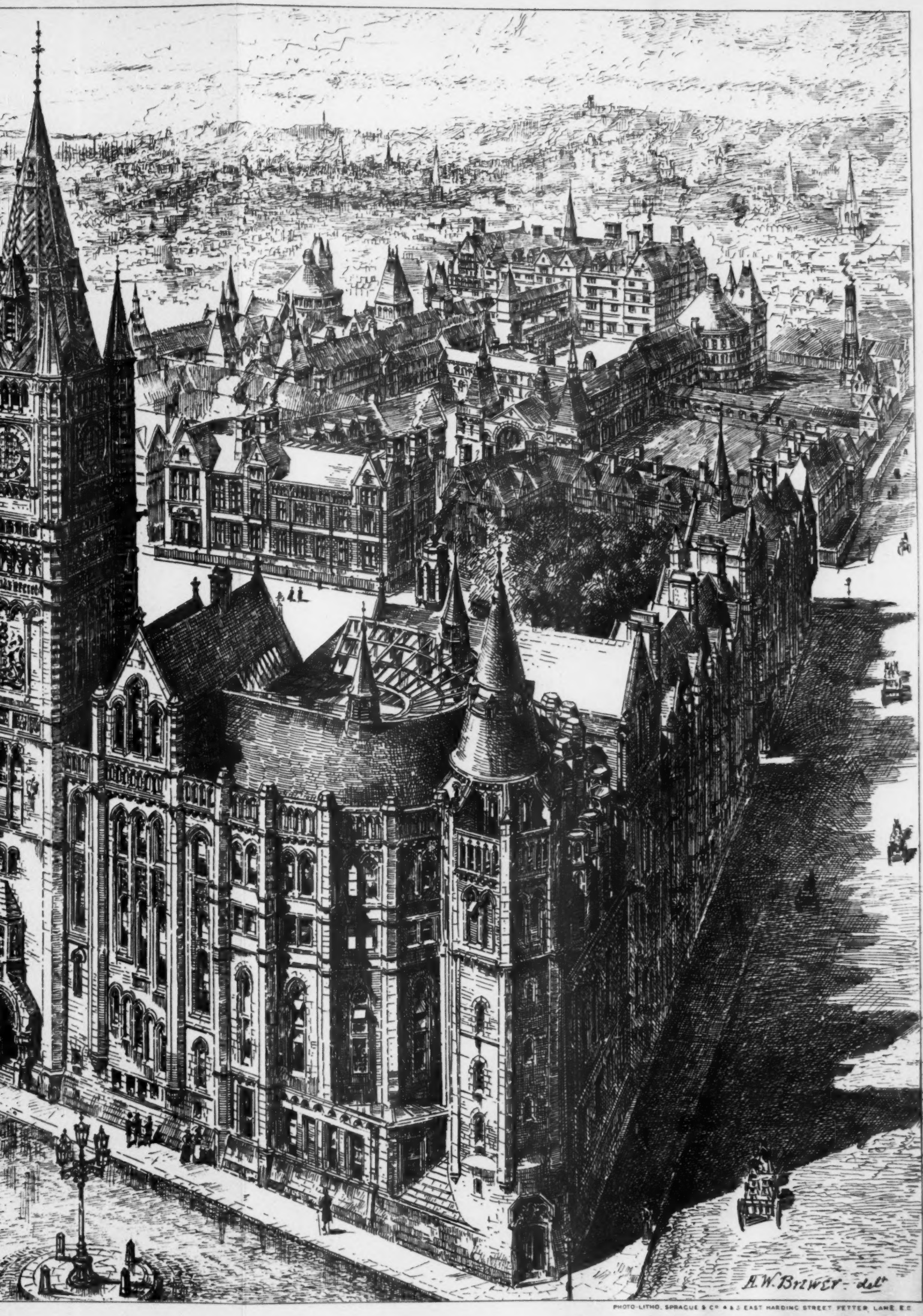
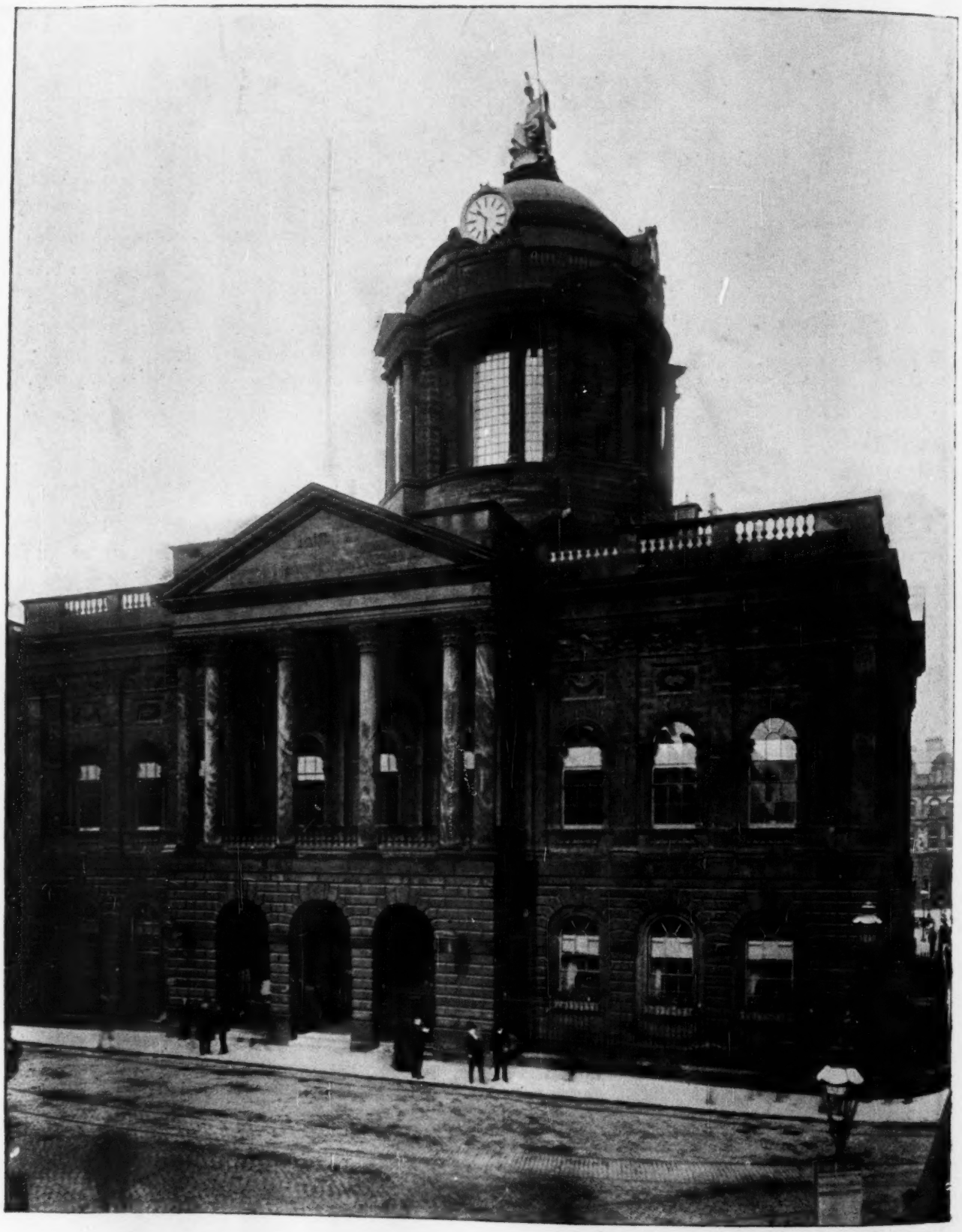


PHOTO-LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

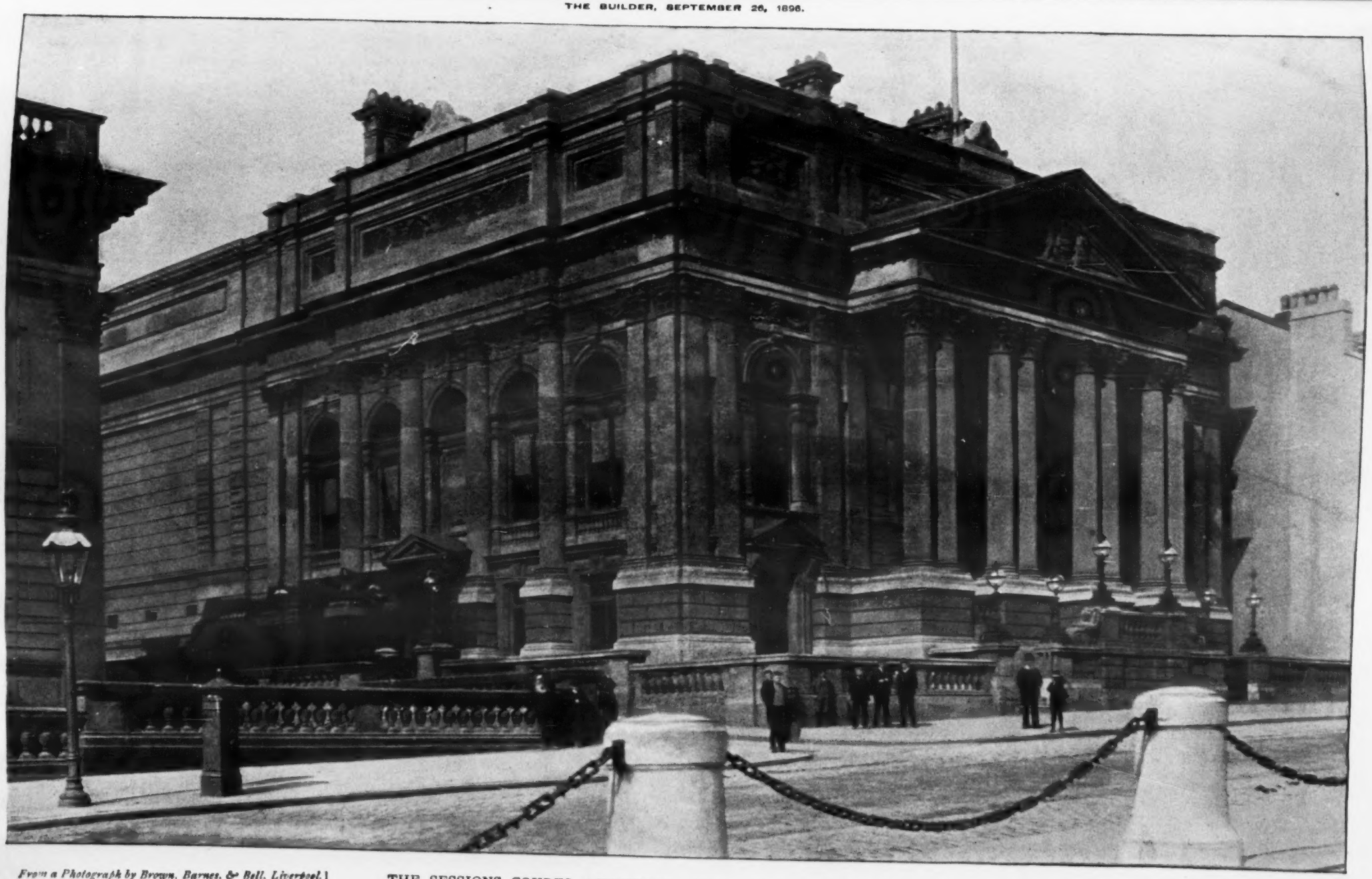
SITY AND ROYAL INFIRMARY.—Mr. A. Waterhouse, R.A., Architect.

Adelphi Bank,
Liverpool.



THE TOWN HALL, LIVERPOOL.—Designed by Wood, of Bath (*circa* 1750).

THE BUILDER, SEPTEMBER 26, 1896.



From a Photograph by Brown, Barnes, & Bell, Liverpool.]

THE SESSIONS COURTS, LIVERPOOL.—MESSRS. F. & G. HOLME, ARCHITECTS.

THE SESSIONS COURTS, LIVERPOOL.

THIS building was erected in 1884 from the plans and designs of Messrs. F. & G. Holme, of Liverpool, to provide for the Sessional Courts of Liverpool, the Assize Courts being provided for in St. George's Hall.

The large Court is about the same size as those in St. George's Hall; the small, the second one is used as an overflow Court at Sessions, and as a Summary and Petty Sessions Court.

On the raised ground floor are the large and small Session Courts, Barristers' rooms, Clerk of Peace, Magistrates' consulting room behind the Bencher of the Courts, two Jury rooms, and a large Magistrates' room or general room for Court purposes, the latter a handsome apartment with an elaborate ceiling decorated in Italian style, and walnut-wood panelling to the walls. The solicitors' rooms are provided for on the lower ground floor. On the upper floor are rooms for the attendants, Grand Jury room, and Dining Room.

The design has been somewhat injured by the limited space on which it stands, and by the restrictions imposed by the Local Authorities, who required the frontage to be set back to the line of other buildings, and by the widening of a side street an elevation has been exposed which was not intended to have prominence. Nevertheless, the building makes an effective addition to rather remarkable group of modern Classic structures with which it is associated.

NOTES ON THE BRITISH ASSOCIATION MEETING.

THE Presidential address of this year was an essentially medical one, as might be expected. The old theory in regard to the President's address—that it should take the form of a general review of the progress of science during the preceding year, has, in these days of specialisation, gradually dropped out of sight, and the address has tended more and more to take the form of a specialist paper on the branch of study to which the President for the year has mainly devoted himself. The old practice of making the address a general review of the position appears to us to have been a more reasonable one in itself, but it is one which it is becoming every year more and more difficult to carry out.

At the meetings on Friday, the 18th, two papers were read, each of which included a consideration of subjects of some special interest to our readers. One of these was the address of Sir Douglas Fox as President of the Mechanical Section, the other that of Mr. Arthur Evans as President of the Anthropological Section. Sir Douglas Fox commenced his address by a general reference to some of the great engineering works of recent date. He then touched on one of the great subjects of local interest, the endeavours which had been made to clear the "bar" of the Mersey, referring also to the similar cases of the estuaries of the Dee and the Ribble. When it is considered that the very life and existence of a city situated on a tidal estuary consists in keeping the entrance to the port accessible, it is evident what a wide reaching subject this is. As far as the locality is concerned it affects commerce, architecture, everything. On this point Sir Douglas Fox said:—

"To the hydraulic engineer there are few rivers of more interest, and presenting more complicated problems, than the Mersey and its neighbours, the Dee and the Ribble. They all possess vast areas of sand, covered at high water, but laid dry as the tide falls, and in each case the maintenance of equilibrium between the silting and scouring forces is of the greatest importance to the welfare of the trading communities upon their banks. The enclosure of portions of the areas of the respective estuaries for the purposes of the reclamation of land, or for railway or canal embankments, may thus have far-reaching effects, diminishing the volume of the tidal flow and reducing the height of tide in the upper reaches of the rivers. Some idea of the magnitude of these considerations may be derived from the fact that a spring tide in the Mersey brings in through the narrows between Birkenhead and Liverpool 710 millions of cubic yards of water to form a scouring force upon the ebb. The tidal water is heavily laden with silt, which is deposited in the docks, and, at slack water, upon the sandbanks. The former is removed by dredging, and amounts to some 1,100,000 cubic yards per annum; the latter is gradually fretted down into the channels and carried out to sea before the ebb. Whilst a considerable portion of the narrows is kept scoured, in some places right down to the sandstone rock, there is a tendency on the Liverpool side, near the landing-stage, to silt up; a difficulty counteracted, to some extent, by the extensive sluicing arrangements introduced by Mr. George Fosbery Lyster, the engineer of the Mersey Docks and Harbour Board.

Very extensive and interesting operations have been carried on by the Board in connexion with the bar at the mouth of the river. Dredgers specially designed for the purpose have been employed for some six years, with the result that 15,142,600 tons of sand and other dredged matter have been removed, and the available depth of water at low-water increased from 11 ft. to 24 ft. in a channel 1,500 ft. in width.

Those who have made the transatlantic passage in former years can more readily appreciate the very great advantage accruing from this great improvement.

Formerly, vessels arriving off the port on a low tide had to wait for some hours for the water-level to rise sufficiently to enable them to cross the bar. The result of a large vessel lying outside, rolling in the trough of the sea with her engines stopped, was that not infrequently this proved to be the worst part of the voyage between New York and Liverpool, and passengers who had escaped the malady of sea-sickness throughout the voyage were driven to their cabins and berths within three or four hours of landing.

Owing to the very successful dredging operations, ships of largest size can now enter or depart from the Mersey at any state of the tide, and they are also able to run alongside the landing-stage without the intervention of a tender.

Whilst the estuary of the Mersey presents a narrow entrance with a wide internal estuary, the Dee, owing to extensive reclamation of land in the upper reaches, has a wide external estuary leading to an embanked river of very limited width, up which the tide rushes with great velocity laden with silt, rising in some two hours, then, during a short time of slack water, depositing the silt, which is not removed by the ebb-tide, spread over some ten hours, and therefore having comparatively little velocity. In this case also the outer estuary shows a great tendency to silt up beyond the reach of any but the highest spring tides.

The reclamation of the Ribble has not yet proceeded so far as to so seriously affect the general conditions of the estuary; but here also there is a constant tendency in the channels to shift, and the erosion which takes place when a high tide and wind combine is very remarkable."

Sir Douglas Fox then proceeded to the consideration of the subject of electric and mechanical traction, in which he observed that Great Britain was behind the rest of the world, owing to a great extent to mistaken legislation which had strangled electrical enterprise in this country, especially in comparison with the United States. Sir Douglas Fox naturally looks on this subject from the point of view of an engineer, and sums up on the whole in favour of the overhead wire system. Those however who consider the terrible way in which cities are disfigured, as many of the United States cities are by the continual multiplication of systems of overhead wires, may well be inclined to pause before accepting the recommendation of a system which involves such results on the appearance of a city, not to speak of the many dangers and inconveniences resulting from the employment of such a system. Sir Douglas Fox then touched on the subject of the great modern improvements in ventilation, especially in regard to tunnels; a subject which has recently been much discussed in regard to the Metropolitan Railway. As an example of what may be done to improve the condition of a railway tunnel, he instanced the case of the Pracchia tunnel on the Florence and Bologna Railway. The length of the tunnel is 1,900 metres, or about 2,060 yards; it is for a single line, and is on a gradient of 1 in 40. When the wind was blowing in at the lower end, the steam and smoke of an ascending train travelled concurrently with the train, thus producing a state of affairs almost unimaginable except to those engaged in working the traffic. Owing to the height of the Apennines above the tunnel, ventilating shafts are impracticable; but it occurred to Signor Saccardo that, by blowing air by means of a fan into the mouth of the tunnel, through the annular space which exists between the inside of the tunnel arch and the outside of the traffic gauge, a sufficient current might be produced to greatly ameliorate the state of things. The results, we are told, have been most satisfactory, the tunnel, which was formerly almost dangerous, under certain conditions of weather, being now kept cool and fresh, with but a small expenditure of power.

In regard to the construction of tunnels generally, Sir Douglas Fox observed that the great improvements in sub-aqueous tunnelling can be clearly recognised from the fact that the Thames Tunnel cost 1,150*l.* per lineal yard, whilst the Blackwall Tunnel, consisting of iron lined with concrete, and of 25 ft. internal diameter, has, by means of Greathead's shield and grouting machine, been driven from shaft to shaft, a distance of 754 yds., for 375*l.* per yard. Tunnels have now been successfully constructed through the most difficult strata, such as water-bearing silt, sand and gravel, and, by the use of grouting under pressure, subsidence can almost entirely be avoided, thus rendering the piercing of the substrata of towns, underneath property without damaging it, a simple operation; and opening up to practical consideration many most important lines of communication hitherto considered out of the question. On the other hand, very little improvement has taken place in the mode of constructing tunnels in ordinary ground, since the early days of railways. The engineers and contractors of those days adopted systems of timbering and construction which have not been surpassed. The modern engineer is, however, greatly assisted by the possibility of using Brindle bricks of great strength to resist pressure, combined with quick-setting Portland cement, by the great improvements which have taken place in pumping machinery, and by the use of the electric light during construction.

After referring to the necessity for larger terminal stations for our great railways, a necessity which every-day observation must force on the consideration of all travellers, Sir Douglas Fox proceeded to consider the question of "Light" Railways, leaning to the view which we think is the common-sense one, that light railways of narrow gauge, which cannot connect with the ordinary railway, will be but a very doubtful advantage, and that the assistance to local traffic which they have been expected to furnish may be much more hopefully looked for from motor cars, so soon as they can be improved in construction and working, those at present offered to the public being ugly in appearance, noisy, difficult to steer and work; but he considers that with improvements in these respects there is a future for the motor car, more especially as it is calculated that two-thirds of the present wear and tear of roads is caused by horses, and one-third only by wheels.

Mr. Arthur Evans's rather diffuse address to the Anthropological Section touches to some extent on the subject of ancient art, especially in regard to the widespread prevalence of the spiral form in decoration, which he considers implies a connexion between countries and ages generally regarded as independent of one another. The prevalence of this ornament in Irish work does not necessarily imply a Scandinavian origin. "In Sardinia there is evidence of the former existence of monuments of Mycenæan architecture in which the chevron the lozenge and spiral might have been seen associated as in Ireland; and it has long been Mr. Evans's conviction that "the Ægean spiral system itself must be regarded as an offshoot from that of ancient Egypt, which as a decorative motive on scarabs goes back, as Professor Petrie has shown, to the fourth dynasty. . . . But the important feature to observe is that here, as in the case of the early Ægean examples, the original material on which the spiral ornament appears is stone, and that, so far from being derived from an advanced type of metal work, it goes back in Egypt to a time when metal was hardly known," and he adds that the appearance of this early Ægean ornament would be found to lead to the demonstration of a direct intercourse between the Greek islands and Egypt at least a thousand years earlier than has hitherto been allowed. The question suggests itself to us whether there are not certain simple forms of ornament, of which the spiral is one and the various forms of the Greek fret another, which are evolved, in slightly different forms, by many nations at a certain early stage of culture, and whether their recurrence does not point to an origin more universal than special to any particular race.

In the Economic Science Section on Saturday, the subject of "Metric Measures and our old System" was treated in a paper by Mr. Frederick Toms, who thought that the public would have to accommodate itself to a new system of weights and measures, and that the metric system would before long be legalised. But the system had defects as well as advantages; admirable as it

was for scientific purposes and large commercial transactions, it was not well adapted for the small transactions of life. In France the want of the old subdivisions had proved to be a source of great inconvenience. In this country, if a new code were compiled, there would be no need to sweep away the method now in force, as the two systems might be combined. Endless confusion would be sure to result from an attempt to compel the untaught population to use tenths and hundredths of a kilogramme or dekalitre instead of following the ancient practice of dealing in pounds and ounces, quarts and pints. His view did not meet with much support in the discussion, some speakers wishing for a compulsory adoption of the metric system at a fixed date, others, among whom was Sir F. Bramwell, urging that the metric system was not so easy as it was thought to be, and that in many transactions there was often risk of error from accidental misplacing of the decimal point. Our feeling is in favour of either leaving it alone or introducing the decimal system entirely, but there is no doubt that we are yet rather far from being ready for so drastic a reform. The French system of money calculation by decimal proportions is certainly easier and readier than ours, but it would take a long time to persuade the less educated portion of the public to think so.

On Monday the Anthropology Section attracted a large audience. Among the papers read was one by Dr. Gladstone on "the transition from pure copper to bronze made with tin," in which he traced the stages in the efforts to procure a harder metal than copper. He stated that Professor Flinders Petrie had found a bronze bar at Medum, in Egypt, in one of the small tombs belonging to the fourth or fifth dynasty. Bronze came gradually to have 10 per cent. of copper. The brass of the early Israelitish period of the Bible was bronze. The immense amount of bronze used in ancient times, 5,000 years ago, was astounding. The question as to where this large amount of tin was obtained was still unsolved. Dr. Montelius doubted whether the bronze bar found by Professor Petrie belonged to the tomb where it was found, for that would mean that bronze was used in the fourth or fifth dynasty. He knew no instance of the use of bronze containing 9 or 10 per cent. of copper before 2,000 B.C.

The evening discourse on Monday by Professor Flinders Petrie was a most remarkable one, though we cannot say how it came to be delivered at the British Association for the advancement of science, for it was rather an asthetic or philosophical paper than a scientific one. The subject was "Man before writing," and the main tendency of it was to imply that writing had been overrated as a medium of the expression of thought, and that early art before writing was more free, more genuine and more significant than after writing was introduced. This is of course an immense subject, on which volumes almost might be written, and we are inclined to think that Professor Petrie has been carried much too far by the interest which his own special researches have led him to take in the art of non-writing peoples. He even wishes to place archaic Greek art higher than that of the Periclean period. He says that when we look at the brilliant work of the Mycenæan age of Greece, we there see the expression of the mind in closest touch with nature, as in the subjects on the Vaphio cups which he places at 1,200 B.C.

"Perhaps some will say that because these works are found on Greek soil therefore they are altogether an exception. But, set them by the side of any later work in the literary age of Greece. Not a single piece of the same small size can be said to exceed their artistic skill and nobleness; and though large sculptures on ten or twenty times the scale may be more elaborated, it is questionable if any—even the struggles of the centaurs and Lapithæ—appeal more truly to nature and to the glory of action."

On this we observe that modern artists do not consider the Centaur and Lapithæ sculptures by any means the best work of the great period of Greek sculpture, so that Professor Petrie's argument is somewhat incomplete. Some of his suggestions in regard to signs derived from architectural construction are interesting. The great feature of architecture the column, he observes, was settled before the rise of writing.

"The tent-pole column is one of the most elementary signs, that for the idea of 'greatness,' the long pole being, as all tent-dwellers will remember, the great encumbrance in moving, longer and more in the way than anything else. That this is the tent pole is evident from its pointed bottom, different to any column; and a very early sign for a place of assembly or a festival is the view of a building with the roof propped up in the middle by such a pole. In later times this became the source of a strange form of column, which has never been explained until compared with the primitive tent pole hieroglyph. Another support is derived apparently from the bundle of reeds tied firmly together near the top, and plastered over with the Nile mud. That such a pillar will bear a great weight may be seen by the side of every canal in Egpyt. And even more advanced forms were known. The fluted column was familiar, and became the regular sign for the very early city of Heliopolis, probably the earliest city whose origin we can guess at, far older than the Egyptian Monarchy. Such a city would have a sign so soon as writing was begun, and that sign is the sixteen-sided fluted column with a tapering shaft. Thus that form is carried back into the unlettered ages which we cannot hope to touch with any continuous record. And not only was the column used, but also the abacus and the grouping in a portico. Thus we see that in Egypt all the principal features of architecture, which lived through 4,000 years of history, were devised and used by the man before writing." This remark, no doubt, will be welcomed by the modern school of critics who consider that all the failures in modern architecture arise from drawing. All this is interesting and suggestive; whether it proves anything is another question.

The suggestion made by Professor Petrie at another meeting, for the establishment of a great ethnological storehouse for all the records found which relate to the history of the race, is a grand idea, but the practical difficulty in carrying it out (or one of the difficulties) will be that which was pointed out by one speaker, that in the present condition of scientific patriotism the discoverers of one country will not send their specimens to a museum in another country, and till the days of "The parliament of man, the federation of the world," we fear that difficulty will be insuperable.

The papers read before the section devoted to Geology were not of much interest, hardly anything novel was announced, and the communications generally were far below the standard. The President, Mr. J. E. Marr, F.R.S., of Cambridge, in his address passed in brief review several branches of the science, which information might well have been obtained from any of the text-books of geology. Amongst the more important questions yet remaining to be solved were the relation of river-systems to groups of faults, the history of sediments, coral reefs, and coal seams, the character of deep-sea deposits, the connexion between movements of the earth's crust and volcanic phenomena, the explanation of changes of climate in the past, and the origin of crystalline schists. It seems to us that Mr. Marr might well have added to this list questions relating to the economic aspect of the science, more particularly in reference to the movement of underground water, evaporation, and water-supply generally; at the present moment it is highly desirable that searching investigation on these heads should be made.

On Friday Sir W. Dawson contributed a paper on pre-Cambrian fossils, which was singularly inopportune now that the so-called fossils found in the pre-Cambrian of Brittany are shown not to be of organic origin. He exhorted geologists to "pay more attention to the older rocks," with the Utopian idea of reaching backward to the actual beginning of life on our planet. Mr. G. H. Morton read a paper on the range of species in the Carboniferous Limestone, which should prove useful provided the species are correctly identified. Mr. E. B. Wethered, who is still at work on the extremely minute tubular bodies which he believes were instrumental in forming oolite granules, made a communication on the results of a microscopic examination of limestones, showing the occurrence and importance of minute organisms in building up rocks. It may be remembered that Mr. Wethered has done much in the micro-investigation of limestones, many of which are used for building purposes. We have referred to his investigations on more than one occasion in our columns.

COMPETITIONS.

THE LYSAGHT MEMORIAL, WOLVERHAMPTON.—The successful competitor in the designing of the clock and tower which is to constitute this memorial is Mr. Joseph Lavender, of Wolverhampton, and the work is to be carried out by Mr. Lovatt, builder, of that town. The clock will be made by Messrs. Smith & Son, of Derby.

HARTSHILL QUARTZITE ROAD METAL.

THE value of quartzite for macadamising purposes is becoming more and more appreciated as its powers of endurance on roads of medium traffic are tested. The rock is comparatively rare in this country, and is raised principally in the neighbourhood of Nuneaton, in Warwickshire. To the north-west of that town a range of hills runs for about three miles, in which occurs what is known to the geologist as the Hartshill quartzite. The quartzite is much cut up by igneous rocks denominated "diorite" on the official geological survey map of the district, but which appear on close inspection to be a number of different kinds of igneous rocks, some of them by no means diorites; the bulk of them are regarded as nuisances by the quarry-owners for the simple reason that they interfere with the regular working of the quarries and too often represent useless material that has to be removed at much expense in developing the quartzite.

The intercalation of these igneous masses necessarily interferes with the quality of the quartzite at and about the junctions between the two rocks. Every care, however, is taken to select the stone, as we know from personal inspection. But, as in other quarrying districts, there are several qualities, one of the poorest of which contained much "bastard" stone of little or no use for roads.

The best Hartshill quartzite is a light pink-coloured stone, exceedingly compact, and breaking with a hackly or semi-conchoidal fracture. It is full of blind, short joints, the faces of which are covered by a thin film of a ferruginous mineral. Examined under the microscope the stone is seen to be made up almost entirely of quartz grains which, judging from their optical properties, have been subjected to enormous pressure, and they are partially agglutinated. Here and there specks of ferruginous matter appear and these are primarily responsible for the tint of the stone. With the few other (accessory) minerals that occur we need not concern ourselves, as they have no practical bearing on the value of the stone as road metal.

The inferior grades of Hartshill quartzite are not so compact, and earthy ferruginous matter is very common. In a rough way the fracture of the stone sufficiently indicates the difference in structure and composition. The quartz grains are frequently, but locally, bound together by the deposition of secondary quartz.

The following is the chemical composition of some Hartshill stones:—

	I.	II.	III.
Silica	94·45	94·20	81·90
Alumina	2·55	3·29	7·61
Iron oxide	·86	·81	3·04
Lime	·63	·34	3·45
Magnesia	·40	·04	·55
Volatile matter	·34	—	2·20
Potash and soda	·77	1·10	1·25
Water, &c.	—	·25	—

Analysis No. 1 refers to stone from the Hartshill Granite Quarries, Atherstone. It indicates that the material is very pure, and composed almost entirely of silica. The small proportion of alumina, taken together with the iron oxide, found in all the stones, is apparently due to the presence of decomposed felspathic matter.

Analysis No. 2 is the result on samples of the quartzite from Windmill Hill Granite Quarries, Nuneaton. The analyst remarks that this material is made of closely-packed angular grains of white quartz, with a small quantity of darker material, probably disintegrated felspar, the whole being cemented into a rock by a secondary deposit of silica.

Analysis No. 3 results from a sample of stone from Tuttle Hill Quarries, Nuneaton, and does not appear to refer to a pure quartzite. We are unable to understand this analysis, as during our inspection of the quarries we observed that the stone was as much a quartzite as others in the neighbourhood. The analyst states that his results were from a sample which was "a mixture of basalt and quartzitic granite," from which we conclude that he is not very familiar with the science of petrology, and we are at a loss to comprehend what the sample really was. We give the results for what they are worth; the bulk of the stone sent from the quarries is certainly quartzite, though a dark green igneous rock is also exploited.

The specific gravity of the three kinds of stone referred to are respectively as follows, viz., 2·641, 2·680, and 2·80. The value of specific gravity in these cases comes out very clearly; the

lighter the stone the greater its "covering power" on roads per ton, but specific gravity is no index, *per se*, of durability.

The strength of Hartshill quartzite must vary considerably, following the different qualities, but the results on such hard material are always high. On one of the best stones in the district the crushing strain was found to be 24,692 lbs. per square inch.

In regard to the durability of the stone we must remember that all rocks that are made up almost entirely of silica, and are very compact, must be durable. At the same time they are usually brittle. The circumstance that the Hartshill stones contain alumina and ferruginous matter lessens the probability of their being too brittle to make good road stone. A great deal depends on the preparation of the broken stone. We do not desire to enter into the questionof hand-broken *versus* machine-broken macadam; but we should point out that long, thin, splintery pieces of quartzite are not calculated to withstand heavy traffic. The stone should, as far as possible, be cubical; whether cubes of quartzite may or may not be capable of being produced by machinery we leave to the consideration of certain quarry-owners in the district, but we may draw the attention of surveyors to the point.

In conclusion, we must protest against this material being called granite; it is no more a granite than it is a slate or limestone.

ARCHÆOLOGICAL SOCIETIES.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.—An excursion was made by this Society on the 16th inst. to Mount Grace Priory, near Northallerton, where excavations are being made for the Society by Mr. W. H. St. John Hope, who conducted the party over the ruins. He stated that though the Priory of Mount Grace was founded in 1397 by Thos. Holland, Duke of Surrey, for monks of the Carthusian order, and dedicated in honour of the Assumption of Our Lady and St. Michael, yet it was only partly built at the founder's death, and was not completed until the ratification of the foundation by Henry VI., in 1440-1. It was suppressed in December, 1539, when pensions were assigned to the prior, John Wilson, who also received the house and chapel called Le Mounte. The ruins of this still remain on the top of the hill behind the Priory. Since the visit of the Society in 1882, the ruins of the Priory have been almost entirely freed from ivy and other plants, and during the spring of the present year the excavations carried out by Mr. Brown and himself had brought to light a number of interesting features. The eastern part of the church has been cleared out, disclosing the base of the high altar, and on the south side of the choir had been uncovered the walls of a side chapel containing the bases of a tomb and two altars. The chapter-house had also been found and cleared, and the sacristan's house identified and partly excavated. Some interesting remains have also been opened up to the west of the church, and three of the houses on the north of the great cloister freed from the accumulated rubbish. Much more, however, remained to be done. A number of members then went up to St. John's Chapel, after which the Ladyes' Well was inspected; a visit to the Mount terminated the excursion.

THE ESSEX ARCHÆOLOGICAL SOCIETY.—Several members of this Society visited Hornchurch on the 12th inst. for the purpose of examining the village church. The vicar, the Rev. R. Johnson, pointed out several interesting features. The tomb still remains of William Hayloff, who placed the spire on the tower of the church, and to whom, it is related, the chancel owes its existence. It narrowly escaped destruction to make way for choir stalls when the church was last restored. As it is, the brasses are covered up by the top slab being upside down. In a window near by are some fragments of old glass, on one piece of which there is a figure of a king seated, believed to represent Edward the Confessor. There is a device above one of the arches in the aisle considered to be merely an ornament intended to have been continued, or it may be representative of the union of the Roses in the reign of Henry the Seventh, when the church was renovated. On the turret is a small figure of William Wykeham, the reputed builder of the church, sitting in his episcopal robes, with his hands raised as in the act of blessing. Upminster Church was next visited, the Rev. P. M. Holden, rector, being in attendance. Here Mr. T. Wilson read a short paper. Although much of the church has been rebuilt, there are still some Norman remains. Near the chancel is the monument of Sir James Esdale, who was a Lord Mayor of London, and built most of the houses in the neighbourhood. The font was given in 1730 by one of the Branfills. After a visit to the rectory house and grounds the meeting terminated.

THE CUMBERLAND AND WESTMORLAND ANTIQUARIAN AND ARCHÆOLOGICAL SOCIETY.—The autumn meeting of this Society was held at Coniston and Broughton-in-Furness on Wednesday and Thursday, the 16th and 17th inst. On Wednesday Coniston Old Hall, the ancient seat of the Flemings, was inspected, and Mr. Collingwood read a paper, by Mr. H. Swainson Cooper, of Hawkshead, on this subject. It appeared that the Flemings resided at this hall until 1681, when Sir Daniel Fleming, the antiquary, removed the seat of his family to Rydal, which came into his possession from Sir John de Lancaster. The hall is now used as a farm-house, and, although much modernised, possesses great antiquarian interest. The party then drove to Torver, where the Rector, the Rev. T. Ellwood, read a paper on the ancient church at that place, which dates back to 1127, when it was a chapelry under Ulverston, 16 miles away. The chief interest was the inspection of a deed issued by Archbishop Cranmer, to which was affixed his seal giving the people of Torver the right to bury at this place. A further drive brought the party to the shores of Coniston Lake, from which boats were taken to Peel Island, where Mr. Collingwood has lately been busy excavating. He explained that he had found foundations of walls indicating occupation of the island at a remote period. The masonry was of a rude character, but proof was afforded that the place had been utilised as a peel or stronghold, probably a safe place in troublesome times. The excavations had disclosed a great deal of charcoal, slag, nails, and pottery of an early mediæval type. Passing up the lake in the steam gondola the members were shown the site of four bloomeries, where iron was smelted from Furness ores by means of the coppice woods surrounding the place, which were turned into charcoal. Thursday's excursions embraced a visit to Broughton-in-Furness and the Druidical circle at Swinside in Cumberland. Afterwards Broughton Tower was seen and a communication on the subject was made by Mr. J. Fell. The Rev. F. A. Malleson, vicar, read a paper on Broughton Church, and the meeting was brought to a close.

ENGINEERING SOCIETIES.

BELFAST MECHANICAL AND ENGINEERING ASSOCIATION.—The members of this Association paid a visit to the Belfast Corporation Gasworks on Saturday, the 12th inst., with the object of examining the working of the water-gas plant. Mr. Stelfox received the visitors, and explained the process. First, coke is piled into a generator, ignited, and raised to a high temperature, the products passing over into a second vessel called a carburetter, at the entrance to which air is admitted to assist the combustion. The resultant gases then pass into a third vessel, or superheater, where air can also be admitted, if necessary, to complete the combustion. The final products pass through a stack valve into the atmosphere. This completes the first part of the process, which is known as "blowing," and is simply to get up the heat necessary for the second part of the process. The carburetter and superheater are filled with chequer work of fire-brick, and when the temperature reaches about 1,700 deg., Fahr., gas making, or "running," is started. The blast is shut off, the stack valve closed, and steam at about 100 lbs. pressure is admitted to the generator, and, passing through the hot coke, is delivered into the carburetter as a gas which has no illuminating value, but high heating power. Entering the carburetter, it is met by a charge of petroleum oil, which is at once vapourised and picked up by the non-illuminating water gas, and the mixture coming in contact with the hot brick-work, the complete "cracking" or gasification of the oil is effected. This carburetted water gas is afterwards cooled and purified the same as ordinary gas. Proceeding to the working platform of the two sets of water-gas plant at present in operation, the members were able to compare it with the ordinary coal-gas plant. Leaving this house the following places were visited in turn:—The boiler-house, where there are two boilers fired with a tar oil, which is a by-product of the water gas process; the blast engines, exhausters, and a small compensating gasometer, which has spiral guides instead of the ordinary vertical type, into which the water-gas is first delivered, owing to the process of making being intermittent. In the new boiler-house there are four water-tube boilers arranged so that they may be fired either with tar oil or ordinary fuel. In the engine-house are six sets of engines and blowers. The new plant consists of four complete sets, each capable of producing one million cubic feet per day. The retort-houses, condensers, and purifiers in connexion with the coal-gas plant were also examined; and after the usual votes of thanks the visit ended.

AWARDS AT THE NEWCASTLE SANITARY EXHIBITION.

WE give here the majority of the awards given at the Sanitary Exhibition at Newcastle, from the Official Report, omitting those which are not of special interest to the readers of this journal.

Silver Medals.

Davis Gas Stove Co., London.—Enamelled "Metropolitan" Gas Kitchener.

J. Defries & Sons, London.—(1) Geneste Herscher Saturated Steam Disinfector; (2) Non-pressure Filters with Rapid Output.

The Expanded Metal Co., London.—Expanded Metal.

Bronze Medals.

Albion Clay Company, Burton-on-Trent.—Sykes' Deep Seal Gullies.

Barnett, Rowland, & Co.—Electric Lighting Plant.

Bowes, Scott, & Western, London.—(1) Corbelled Glazed Lavatory Basin; (2) Automatic Flushing Grease Trap.

British Sanitary Company, Glasgow. — Earth-closet.

The "Cannon" Hollow-ware Co., Bilston.—(1) The "Hercules" Gas Cooker; (2) Enamelling Cast Iron.

John Carr & Sons, North Shields-on-Tyne.—(1) Enamelled and Decorated Fireclay Tiles; (2) Cane Glazed Sinks.

The Cordelova Co., Edinburgh.—Cordelova Wall Coverings.

Crozier, Stephens, & Co., Newcastle-upon-Tyne.—Glass with Embedded Wire.

J. Defries & Son, London.—Indicator of Carbonic Acid Gas in Air.

Elswick Court Marble Works Co., Newcastle-upon-Tyne.—"Hotspur" Ranges (Cooking).

Emley & Sons, Limited, Newcastle.—(1) Welded Conical Boiler; (2) Teale's Well Fire; (3) "Neville" Cooking Range with Baking Oven.

Evered & Co., London.—"Eveflus" Water Waste Preventer.

W. C. Gibson & Co., Newcastle-upon-Tyne.—White Enamelled Fireclay Sinks.

Wm. Harriman & Co., Newcastle-upon-Tyne.—(1) White Glazed Sinks; (2) Barron's Channel-bends with room to receive Drain Plug.

George J. Hutchings, London.—Steam Cookers.

Wm. Ingham & Sons, Wortley, Leeds.—Salt Glazed Sinks.

George Jennings, London.—Hot and Cold Water Mixer, with Indicating Thermometer.

John Jones, London.—(1) Deep Seal Gullies; (2) Improved Expanding Bag Drain Stopper.

J. Geo. Kirtley, Sunderland.—Smoke Machine for Testing Drains.

Leeds Steel Works, Hunslet, Leeds.—Girder Flange Bar.

Sanitation Improvement Co., Woverhampton.—Day's Stafford Closet.

Shanks & Co., Barrhead.—(1) "Fin de Siècle" Bath, with "Modern" Waste; (2) Urinals with Enamelled Fireclay Backs for Automatic Flushing.

Smokeless Fire Co., London.—Smoke Consuming Cooking Range.

Hy. Walker & Son, Newcastle-upon-Tyne.—(1) Bowes' Well Fire; (2) New Ventilator and Draught Regulator attached to Eagle Range.

Charles Wilson and Sons, Leeds.—Canopy Gas Stoves.

Exhibits selected for practical trial.

Richard Clarke & Co., Heckmondwike.—"Eureka" lead encased Block Tin Water Pipe.

G. & F. Couzens, Cardiff.—Tidal Valve Interceptor.

Crozier, Stephens & Co., Newcastle-upon-Tyne.—Judge's Valve, for preventing the waste of water.

J. Defries & Sons, London.—(1) Differential Gas Regulator; (2) Current Steam Disinfector.

J. Duckett & Son, Burnley.—(1) Ten Gallon Underground Tipper; (2) Twenty Gallon Automatic Flushing Tank; (3) Ten Gallon Overhead Bufferless Tilting Vessel.

Emley & Sons, Limited, Newcastle.—Incandescent (Welsbach) Gas-light and Fittings.

O. L. Falconar, Newcastle-on-Tyne. — Electric Fans for Lavatories.

The Horsfall Refuse Furnace Co., Leeds.—Model of Refuse Destructor and Wall Diagram.

George Jennings, London.—(1) Siphonic Closet, without Waste Preventing Supply Valve; (2) Siphonic Closet with Waste Preventing Overflow Regulating Supply Valve.

Jeyes Sanitary Compounds Co., London.—(1) Jeyes' Preparations; (2) Jeyes' Fluid.

John Jones, London.—(1) Ball Valves; (2) Stopper to Clearing Arm of Intercepting Trap; (3) "Sydney" Water Waste Preventer.

"Loco" Draining Apparatus Co., Manchester.—"Loco" Lavatory Basin, with Self-flushing Overflow Pipe.

North-Eastern Glazed Brick and Tile Co., Newcastle-upon-Tyne.—Opalite.

Shanks & Co., Barrhead.—(1) Instantaneons Water-heaters; (2) Simple "Barrhead" Siphonic Closet.

James Stott & Co., Oldham.—"Stott Thorp" Reflex Light and Ventilating Sun Burner; (2) The Stott Gas Governor; (3) The "Stott" Power Driver and Electric Air Propellers.

Thresh Disinfector Co., Chelmsford.—(1) Portable Disinfecting Apparatus; (2) Thresh Current Steam and Disinfecting Apparatus.

The Torpedo Ventilator Co., Sheffield.—(1) Torpedo Ventilator, Upright Pattern; (2) Torpedo Ventilator for Ships; (3) Torpedo Ventilator for Soil-pipes and Railway Carriages.

Henry Walker & Son, Newcastle.—Connel's Flue Ventilator.

H. Watson & Sons, Newcastle-upon-Tyne.—(1) Trott's Bib Valves; (2) Judge's Self-Closing Springless Water Tap; (3) Lord Kelvin's Bib-valve.

Correspondence.

To the Editor of THE BUILDER.

BELFAST MUNICIPAL BUILDINGS COMPETITION.

SIR,—It is to be hoped that architects will hesitate to take part in the above competition, or in any competition where the conditions are objectionable.

If travelling expenses are not allowed, either it is a foregone conclusion that the work will be carried out by a local architect or the committee do not appreciate the amount of personal supervision requisite to ensure a satisfactory result.

The amount of the commission may appear large, but the working expenses spread over a long period would be heavy, and it is a pity for a committee in work of such importance to begrudge the cost of ample supervision.

They may obtain good materials and sound workmanship with the aid of a "Clerk of Works," but beyond these most necessary matters there are the hundred and one small difficulties which have to be considered on the spot, and the rectification of the unforeseen, though possible, variations which the ingenious mind of the workman (even where devoid of Irish humour) contrives to evolve from the clearest of working drawings.

If these errors are not detected at once, it may be impossible, or too costly, to alter them later on, and the artistic merit of the work is apt to be ruined.

As you, sir, have rightly pointed out, the above conditions are prejudicial, and are apt to form precedents. Surely the Competitions Committee should possess greater powers, and do something more than privately and humbly protest.

If the Institute is to increase in numbers it must earn the respect of the profession generally by prompt and determined action in all such matters. By safeguarding the interests of the profession it will win popularity and find loyal support.

JOHN BELCHER.

YORK WATER-GATE AND NICHOLAS STONE.

SIR,—By the courtesy of Mr. Birch, F.S.A., the Curator, I am enabled to send you an extract from the Stone account-book (Soane Museum) cited in your issue of September 19:—

"Some of the most Eminentt Workes that my Uncle Mr. Nickcolas Stone Senior did in England in Holland and Scottland—

The Banqueting Roome atte Whitehall.

The Chappell at St. James House now Standing.

The Staires and Water-gate atte Sumerset House. Hee made the Fingure Nilus and Mr. Kerne the Other. . . .

That Noble Portico hee built at the West End of St. Paules Chirche. Mr. Inigo Jones his desine and Mr. Stones Care in performing the worke.

The Water-Gate att Yorke house hee desined and built and the Right hand Lion hee did frontting the Thames. Mr. Kearne a Jarman his brother by maring his sister did the Shee Lion. [They are both he-lions].

Gould Smithes hall in Foster Lane hee desined and built . . . . [? by Jarman].

The Noble Fronttispeece with Tuisted Collums hee desined and built att St. Marys Churche att Oxford.

In the same yeare hee desined Cornbury house in Oxford Shere.

Then, in Vertue's hand, is—"writ by Charles Stoakes." The account-book includes Stone's list of his works and receipts. He does not mention York House or its water-gate; he uses "made" or "set up," or "agreed for," for all but one item—

In 1631 Agreed with the Right Honbl. Lord Earell of Danby for to mak 3 ston gattes in to the phiseck garden oxford; and to desine a new hows for him at Corenbury in oxfordsheer, and to de Ruckt the workmen and mak all thar. I was thar in 2 years 33 times and my covenant of acord with his lordp was 1000*l*. . . . .

The book is one of four—of MS. matter, accounts, sketches, &c.—relating to the Stones, bought at the sale of G. Vertue's effects by James Paine the elder, architect, whose book-plate they contain. Soane purchased them for 34*l*. 15*s*. There are entries by Vertue, Stokes, and others. In one is a sheet written by Inigo Jones, February 26, 1632, concerning measurements of the Queen's Chapel, Somerset House.

D. M.

SEWAGE FARMS.

SIR,—I have just returned from abroad, and am glad to observe you have been good enough to notice in your columns my paper on "The present status of Sewage Irrigation in Europe and America." As I was, unfortunately, prevented through indisposition from being present at the Newcastle-upon-Tyne Congress, I had no opportunity of taking part in the discussion; and, with a view to prevent mistakes being made, I shall be glad if you will publish the following lines.

It would altogether be a serious mistake to assume that the system of drainage employed on the Leicester Sewage Farm—of utilising the drainage from the uplands for the irrigation of the lower lands—was new or original, or for the first time employed; on the contrary, this principle is almost as old as the hills on which the Beaumont Leys Farm is situated.

It goes without saying, that after the sewage has been raised nearly 200 ft. on to Beaumont Leys—an operation involving an outlay of 3,759*l*. 10*s*. 3*d*. in the twelve months ending March 31 last—it ought not to be allowed to escape to the bottom of the steep slopes in an unpurified condition, where it might have to be raised again for further treatment. It is, therefore, but common sense that where the levels admit of such a course, the sewage, if not sufficiently purified on the top levels, should be run again on land on the lower levels.

This is such an elementary consideration, that we cannot be surprised to find that this principle of irrigating lower lands with the effluent from the lands higher up the slope has been employed by the earliest hydraulic engineers in very ancient times.

Since these very remote times the principle has frequently been made use of, and it is, perhaps, but correct to say that to-day it is considered of such ordinary occurrence that no special mention is made of it; just as little as we are now surprised to hear that sewage is pumped to the top of a hill.

Concerning sewage farms, it is, of course, well-known that Mr. Baldwin Latham established this system for Rugby about 1865, and that Messrs. Crimp and Snook have employed it at the Wimbledon Farm since 1880.

It must, however, not be forgotten that this method consists only in the application of physical laws, and is, consequently, in the purification of the sewage, only a means to the end, not the end itself. It would, therefore, be wrong to say this method purifies the sewage. We now know that the process of mineralising organic waste matters is, in the main, a biological one, which is most actively carried out in the pores of the soil near the surface, and not in dark conduits such as drain-pipes, &c.

In my opinion, therefore, the method of leading the effluent from the upper slopes for further treatment on to the lower slopes plays only a subordinate part in the purification of the sewage, the chief part in the successful purification being without doubt played by the careful management, and for this the town of Leicester owes a great debt of gratitude to Sir Thomas Wright, Mr. Alderman Collins, the Sewage Farm Committee and Mr. Thurston, the bailiff. Had it not been for the untiring energy of Sir Thomas Wright and the never-failing zeal of Mr. Alderman Collins, the farm would not be the success which it is now generally admitted to be.

H. ALFRED ROECHLING.

Leicester, September 21.

SANITARY CONDITION OF UNOCCUPIED HOUSES.

SIR,—In the interest of public health, notwithstanding the strict sanitary laws, there seems to be a point up to the present entirely overlooked; that is, unoccupied premises.

Not only is this the case with London, but with every place, as far as I can speak, that I have been brought in contact with in following my vocation.

Premises become empty, and until they are occupied again (in a great number of instances they run into months and years) the closet and other traps, including interceptors, have no water passing through them, unless by accident some individual, as an intending tenant or purchaser, pulls the lever of a water waste preventer (if the water is still on, or the main cistern not emptied) the traps are all empty through evaporation. Should they be standing with water, it becomes fully charged with impurities; when it ceases to act as a seal, and is as bad and injurious to any one who is looking over the premises as if there were no traps; and empty houses being often closed up, the air becomes thoroughly saturated with sewer gas.

House agents I blame very much for this, as in most cases properties are placed in their hands, and they should see the traps are frequently flushed and charged with clean water; the more so as many of them aspire to be architects, surveyors, sanitary engineers, and builders also. They should be compelled by law to flush all drains at least twice per week.

Only a short time since, in London, I was inspecting some property for the necessary repairs, and I had to leave the premises without finishing on account of the overpowering atmosphere; and this is only one of the many similar experiences I have had.

It seems a very necessary duty of all agents or others interested in property to secure adequate ventilation while keeping all the windows sufficiently closed to guard against bad weather.

I am not at all delicate, but I certainly think something ought to be done to prevent this sort of thing occurring.

My remarks apply equally to every drain trap outside the house, which at times, especially in hot and dry weather, and where there is a separate rain-water drainage system, lose their water seal; and if the surface and soil both run into the sewer, it then happens that any gases have free access into the open yards of houses as well as inside. It certainly cannot, to say the least, do much good to anyone to sample them. If there is no hurt, we can very well dispense with traps and interceptors entirely.

Some people may say the ventilating shafts will carry all this off, but I think a great number of practical people will agree that so many shafts are fixed in such a position that in the summer time they are next to no good (if any are fixed at all).

WM. BRETT.

CHARGES FOR COMPETITION INSTRUCTIONS.

SIR,—I send you enclosed an answer to a letter of mine to some competition promoters saying that I would send 1*l*. 1*s*. if they would return the deposit if I refused to compete within a fortnight.

Now, this point of deposits for competitive conditions wants reforming. At the best it is a clumsy method of saving trouble to the promoters. A competitor has to write out a cheque, and if he does not compete receives another cheque on his returning particulars, all to prevent the promoters from having to send a few particulars which may not be used. In a case like this it is simply made a leap in the dark, for how can any man come to a decision as to whether he will compete until he has read the conditions? And I suppose few men, even if they are well off, care to throw away a guinea.

I think a reform is possible on these lines. Let every one who thinks of competing send an addressed envelope and pay 1*s*., which would certainly more than cover the cost of printing competitive particulars; but some reform is certainly urgently needed. This is the second competition I have let go by in six months, because I do not care to forfeit a guinea without having the means of judging if the conditions are reasonable.

W.

The Student's Column.

RURAL DRAINAGE.—XIII.

ALL manholes, lampholes, flushing chambers, and other accessories must be constructed as the sewers proceed, and provision must be made in the same manner for house drain connexions. The principles to be adopted in the construction of junctions are:—

1. Branch sewers or drains must discharge into main sewers in the direction of their flow.

2. The velocity of the discharge of the branch sewers or drains must not be less than the velocity prevailing in the main sewer.

3. "Branch sewers or drains should have a fall into the main sewer at least equal to the difference in the sectional diameter." ("Rawlinson's Suggestions.")

It is a well-known fact that when the velocity of a liquid carrying matter in suspension is checked, there is a tendency towards deposit. This principle has been one of the most important factors of geological history, and the same cause which has obstructed a sewer has formed a mighty delta. The worst form of junction (except where the tributary drain points up stream, a condition of affairs occasionally met with) is a right angle, either horizontal or vertical; an oblique junction is an improvement; but the proper form is a curve of as large a radius as possible. A slightly increased fall is frequently given to the curved portion of the drain in order to neutralize the additional friction. Where there is a considerable difference between

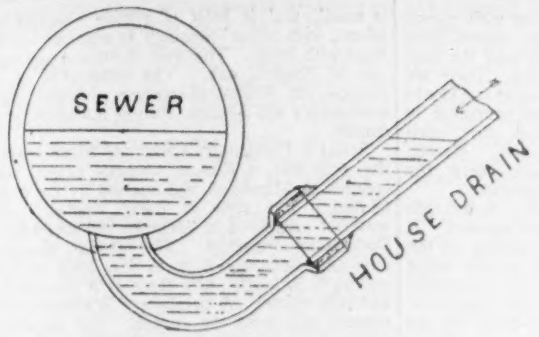


Fig. 27.

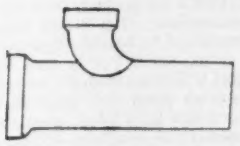


Fig. 28.

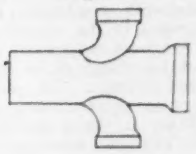


Fig. 29.

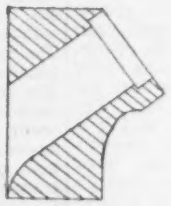


Fig. 30.

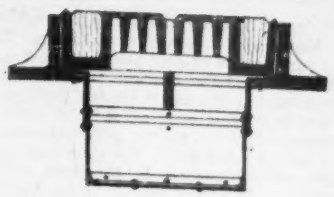


Fig. 31.

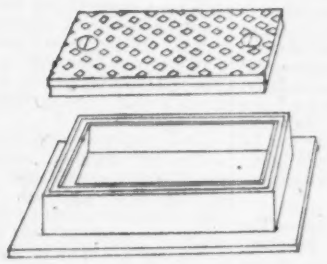


Fig. 32.

Fig. 33.

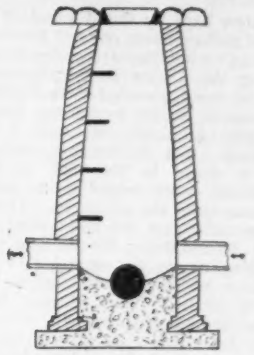


Fig. 34.

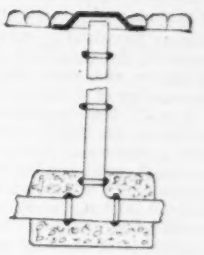


Fig. 35.

the diameter of the main and subsidiary sewer or drain, it will be sufficient if the junction is made in the upper half of the main sewer—the object being that the mouth of the tributary channel shall not be obstructed by the flow in the main sewer. If the contents of the tributary drain fall upon the surface of the liquid in the main sewer, a reduction of velocity and a tendency to deposit will be the result. Perhaps the best construction is where the invert of the tributary sewer or drain is at the surface level of the normal flow in the main sewer.

Mr. Baldwin Latham ("Sanitary Engineering," p. 283) favours a lower position. He says: "the proper position for a junction is within the water-line, but not so low that the flow from it would be checked by the sedimentary deposit that will be rolled along the bed of the sewer. It will be seen that when junctions are so placed that the outfall of a house-drain will be below the water line, the drain will be trapped at its outlet, ..." A system embodying an extreme view has been invented and patented by Dr. Illingworth and entitled "A New System of Sewerage." In this system it is proposed to make the junctions at the invert level of the main sewer (fig. 27), and the advantages claimed are: "Firstly, the removal of the offensive odours emanating from sewers through street ventilators, &c.; and, secondly, the complete separation of the drain air of each house from the sewer-air, thus preventing all danger of infection through the agency of sewers, even when the house-drain traps are out of order or absent altogether." As this idea appears to be so much at variance with all preconceived principles, and as the advantages claimed for it are attainable by other and more rational methods it is unnecessary to discuss it further.

Stoneware pipes are especially made so as to facilitate the construction of junctions, and almost any curve is obtainable.

Fig. 28 is for a single junction, and

Fig. 29 is for a double junction for drains on opposite sides of the principal channel.

Junctions with brick sewers should be made by means of junction blocks built into the sewer.

Fig. 30.—As already stated, junctions should be provided during the construction of a sewer at all points where drain connexions will or may be required. Junctions for future requirements should be in the meantime blocked up with stoneware or cement discs, and the socket flushed up with well puddled clay. The situation of these junctions should be carefully recorded in a book kept for the purpose, so that they can be easily found when required.

The subsequent construction of junctions with a stoneware pipe sewer, and which were not provided for, is a difficult and unsatisfactory matter, especially where the pipes have been jointed with cement. This difficulty is one of the arguments used in favour of bitumen and clay joints.

The process of removing an ordinary pipe from a line of sewer in order to insert a junction is thus described by Mr. Baldwin Latham:—"It is necessary to uncover not less than three pipes, and in large sewers a greater number, before a pipe can be raised out of the work. A pipe is usually removed by placing a lever beneath it and springing a line of pipes up, so that they assume an arched form. The pipe in this way is soon liberated from the work; the junction or another pipe may then be inserted by the reverse operation. Care should be taken after performing this work that the foundation below the line of pipes is properly restored, so as to prevent any settlement at the point where the sewer has been disturbed." ("Sanitary Engineering," p. 202.)

Nevertheless it is frequently impracticable to insert a junction in this manner, and the usually reprehensible process of making a hole in the side of a sewer pipe and making as good a joint as possible with cement has to be adopted as a *pis aller*. In an event of this description the connecting pipe should be short, so that the workman can easily reach to remove any cement which may pass through the joint within the sewer.

As all sewers must be laid from point to point in straight lines, all changes in direction or gradient must take place at the manholes and lampholes.

Manholes are usually brick chambers large enough to permit a man to work in them with freedom, the floor being continuous with the invert of the sewer or sewers upon whose line they are situated, and rising to the surface of the ground. The floor of the manhole may consist of concrete or blue Staffordshire bricks, and channels are formed in it to direct the flow of the sewage. When two or more tributary sewers meet at a manhole, the level of their inverts should be placed above that of the outlet. The manhole is covered over with a grating for ventilating purposes (fig. 31), or with an air-tight cover (fig. 32), depending upon its situation, and upon the method of ventilating the sewers in vogue in the district. The inner surface of the walls of the manhole should be rendered with cement. Iron steps (fig. 33) should be built into the wall to facilitate descent and ascent.

Manholes (fig. 34) may be circular or rectangular on plan, but the latter are more economical in construction.

Lampholes usually consist of stoneware pipes leading from the crown of the sewer to the surface of the ground, and covered with an air-tight cover. Where the sewer consists of stoneware pipes the construction of lamp-holes is very simple, as will be seen from the accompanying. Care must be taken in fixing lamphole covers that weights passing over them shall not be transmitted to the pipes forming the shaft (see fig. 35).

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. J. T. Eayrs, late Borough Engineer of West Bromwich, has opened an office for private practice at Clarence-chambers, 39, Corporation-street, Birmingham.

GENERAL BUILDING NEWS.

WEST HIGHLAND COTTAGE HOSPITAL, OBAN, N.B.—This hospital, which has recently been opened, is on an eminence on the Glencruitten Estate, near Oban. The building, which is treated in the cottage style, suitable to the locality, is at present for the accommodation of twelve beds, besides two private wards and nurses' accommodation. The building is so arranged that, with but very little difficulty, nearly double the capacity can be given to the public wards when extension becomes necessary. It is of Bonawe granite, with freestone dressings; the ridges are of red tiles, and the chimney pots are of the same material. The large wards are heated with Shoreland "Manchester Grates," and the other grates, kitcheners, &c., have been supplied by Messrs. Graham and Morton, of Stirling. Messrs. D. and A. Munn, Oban, were the contractors for the mason and joiner work, the other works being let as follows, viz, plumber, Mr. D. Crawford; plasterer, Mr. D. McCallum; slater, Mr. W. Proctor; bells and gas, Mr. J. Campbell; painter, Mr. Alex. Grey, all of Oban. The architect was Mr. G. Woulfe Brenan, of Oban, whose designs were selected in open competition.

MUNICIPAL BUILDINGS AND TOWN HALL, CHATHAM.—A large block of buildings, to be utilised as Municipal Offices, Town Hall, and Council Chamber, is shortly to be erected at Chatham; it is expected that the work will be commenced at the end of the present year, and the foundation stone laid next March. As at present designed by Mr. G. E. Bond, the building will be in the English Renaissance style, with facings of Monk's-park ashlar, with Portland stone dressings and weatherings. The clock-and-bell tower will have a height of 126 ft. The accommodation will be as follows:—Ground-floor: Principal entrances on the corner leading to a spacious hall containing the grand staircase, which will be of marble, offices for Town Clerk, Town Clerk's Clerk, Borough Surveyor, Surveyor's Clerk, Borough Accountant, Rate Collector, Inspector of Nuisances, School Attendance Officer, large committee room (this room, which will be 45 ft. by 23 ft., is connected by a staircase with the large Town Hall, and may be used as a supper or refreshment room) small committee-room, waiting-room, store-room, strong-room, and cloak-room, also good lavatory accommodation. In addition to the principal, there are four other entrance doors for special convenience of other parts of the building. Principal floor: Large Town Hall, 90 ft. by 45 ft., with ladies' and gentlemen's retiring rooms in the rear of, and at the level of the platform. The roof will be partly open, with trusses arranged in pairs, filled in with turned balusters, and springing from rouge marble columns, on carved corbels, window frames, mullions, transoms, &c., of stone, glazed with leaded lights. Across the end of the hall facing the platform will be a gallery to accommodate about 150 persons. In addition to the principal staircase, there are two other stone staircases at the rear of the hall for entrance and exit. Above the retiring room in the rear of the platform is a large room for an orchestra, having an arched opening, 28 ft. wide to the hall. This, it is suggested, may be used for an organ chamber in the future. The Council Chamber will be 42 ft. by 30 ft., with coved and panelled ceiling, with walls broken

Jeyes Sanitary Compounds Co., London.—(1) Jeyes' Preparations; (2) Jeyes' Fluid.

John Jones, London.—(1) Ball Valves; (2) Stopper to Clearing Arm of Intercepting Trap; (3) "Sydney" Water Waste Preventer.

"Loco" Draining Apparatus Co., Manchester.—"Loco" Lavatory Basin, with Self-flushing Overflow Pipe.

North-Eastern Glazed Brick and Tile Co., Newcastle-upon-Tyne.—Opalite.

Shanks & Co., Barrhead.—(1) Instantaneous Water-heaters; (2) Simple "Barrhead" Siphonic Closet.

James Stott & Co., Oldham.—"Stott Thorp" Reflex Light and Ventilating Sun Burner; (2) The Stott Gas Governor; (3) The "Stott" Power Driver and Electric Air Propellers.

Thresh Disinfector Co., Chelmsford.—(1) Portable Disinfecting Apparatus; (2) Thresh Current Steam and Disinfecting Apparatus.

The Torpedo Ventilator Co., Sheffield.—(1) Torpedo Ventilator, Upright Pattern; (2) Torpedo Ventilator for Ships; (3) Torpedo Ventilator for Soil-pipes and Railway Carriages.

Henry Walker & Son, Newcastle.—Connel's Flue Ventilator.

H. Watson & Sons, Newcastle-upon-Tyne.—(1) Trott's Bib Valves; (2) Judge's Self-Closing Springless Water Tap; (3) Lord Kelvin's Bib-valve.

Correspondence.

To the Editor of THE BUILDER.

BELFAST MUNICIPAL BUILDINGS COMPETITION.

SIR,—It is to be hoped that architects will hesitate to take part in the above competition, or in any competition where the conditions are objectionable.

If travelling expenses are not allowed, either it is a foregone conclusion that the work will be carried out by a local architect or the committee do not appreciate the amount of personal supervision requisite to ensure a satisfactory result.

The amount of the commission may appear large, but the working expenses spread over a long period would be heavy, and it is a pity for a committee in work of such importance to begrudge the cost of ample supervision.

They may obtain good materials and sound workmanship with the aid of a "Clerk of Works," but beyond these most necessary matters there are the hundred and one small difficulties which have to be considered on the spot, and the rectification of the unforeseen, though possible, variations which the ingenious mind of the workman (even where devoid of Irish humour) contrives to evolve from the clearest of working drawings.

If these errors are not detected at once, it may be impossible, or too costly, to alter them later on, and the artistic merit of the work is apt to be ruined.

As you, sir, have rightly pointed out, the above conditions are prejudicial, and are apt to form precedents. Surely the Competitions Committee should possess greater powers, and do something more than privately and humbly protest.

If the Institute is to increase in numbers it must earn the respect of the profession generally by prompt and determined action in all such matters. By safeguarding the interests of the profession it will win popularity and find loyal support.

JOHN BELCHER.

YORK WATER-GATE AND NICHOLAS STONE.

SIR,—By the courtesy of Mr. Birch, F.S.A., the Curator, I am enabled to send you an extract from the Stone account-book (Soane Museum) cited in your issue of September 19:—

"Some of the most Eminentt Workes that my Uncle Mr. Nickcolas Stone Senior did in England in Holland and Scottland—

The Banqueting Roome atte Whitehall.

The Chappell at St. James House now Standing.

The Staires and Water-gate atte Sumerset House. Hee made the Fingure Nilus and Mr. Kerne the Other. . . .

That Noble Portico hee built at the West End of St. Paules Chirche. Mr. Inigo Jones his desine and Mr. Stones Care in performing the worke.

The Water-Gate att Yorke house hee desined and built and the Right hand Lion hee did frontting the Thames. Mr. Kearne a Jarman his brother by maring his sister did the Shee Lion. [They are both he-lions].

Gould Smithes hall in Foster Lane hee desined and built . . . . [? by Jarman].

The Noble Fronttispeece with Tuisted Collums hee desined and built att St. Marys Churche att Oxford.

In the same yeare hee desined Cornbury house in Oxford Shere.

Then, in Vertue's hand, is—"writ by Charles Stoakes." The account-book includes Stone's list of his works and receipts. He does not mention York House or its water-gate; he uses "made" or "set up," or "agreed for," for all but one item—

In 1631 Agreed with the Right Honbl. Lord Earell of Danby for to mak 3 ston gattes in to the phiseck garden oxford: and to desine a new hows for him at Corenbury in oxfordsheer, and to de Ruckt the workmen and mak all thar. I was thar in 2 years 33 times and my covenant of acord with his lordp was 1000*l*. . . . .

The book is one of four—of MS. matter, accounts, sketches, &c.—relating to the Stones, bought at the sale of G. Vertue's effects by James Paine the elder, architect, whose book-plate they contain. Soane purchased them for 34*l*. 15*s*. There are entries by Vertue, Stokes, and others. In one is a sheet written by Inigo Jones, February 26, 1632, concerning measurements of the Queen's Chapel, Somerset House.

D. M.

SEWAGE FARMS.

SIR,—I have just returned from abroad, and am glad to observe you have been good enough to notice in your columns my paper on "The present status of Sewage Irrigation in Europe and America." As I was, unfortunately, prevented through indisposition from being present at the Newcastle-upon-Tyne Congress, I had no opportunity of taking part in the discussion; and, with a view to prevent mistakes being made, I shall be glad if you will publish the following lines.

It would altogether be a serious mistake to assume that the system of drainage employed on the Leicester Sewage Farm—of utilising the drainage from the uplands for the irrigation of the lower lands—was new or original, or for the first time employed; on the contrary, this principle is almost as old as the hills on which the Beaumont Leys Farm is situated.

It goes without saying, that after the sewage has been raised nearly 200 ft. on to Beaumont Leys—an operation involving an outlay of 3,759*l*. 10*s*. 3*d*. in the twelve months ending March 31 last—it ought not to be allowed to escape to the bottom of the steep slopes in an unpurified condition, where it might have to be raised again for further treatment. It is, therefore, but common sense that where the levels admit of such a course, the sewage, if not sufficiently purified on the top levels, should be run again on land on the lower levels.

This is such an elementary consideration, that we cannot be surprised to find that this principle of irrigating lower lands with the effluent from the lands higher up the slope has been employed by the earliest hydraulic engineers in very ancient times.

Since these very remote times the principle has frequently been made use of, and it is, perhaps, but correct to say that to-day it is considered of such ordinary occurrence that no special mention is made of it; just as little as we are now surprised to hear that sewage is pumped to the top of a hill.

Concerning sewage farms, it is, of course, well-known that Mr. Baldwin Latham established this system for Rugby about 1865, and that Messrs. Crimp and Snook have employed it at the Wimbledon Farm since 1880.

It must, however, not be forgotten that this method consists only in the application of physical laws, and is, consequently, in the purification of the sewage, only a means to the end, not the end itself. It would, therefore, be wrong to say this method purifies the sewage. We now know that the process of mineralising organic waste matters is, in the main, a biological one, which is most actively carried out in the pores of the soil near the surface, and not in dark conduits such as drain-pipes, &c.

In my opinion, therefore, the method of leading the effluent from the upper slopes for further treatment on to the lower slopes plays only a subordinate part in the purification of the sewage, the chief part in the successful purification being without doubt played by the careful management, and for this the town of Leicester owes a great debt of gratitude to Sir Thomas Wright, Mr. Alderman Collins, the Sewage Farm Committee and Mr. Thurston, the bailiff. Had it not been for the untiring energy of Sir Thomas Wright and the never-failing zeal of Mr. Alderman Collins, the farm would not be the success which it is now generally admitted to be.

H. ALFRED ROECHLING.

Leicester, September 21.

SANITARY CONDITION OF UNOCCUPIED HOUSES.

SIR,—In the interest of public health, notwithstanding the strict sanitary laws, there seems to be a point up to the present entirely overlooked; that is, unoccupied premises.

Not only is this the case with London, but with every place, as far as I can speak, that I have been brought in contact with in following my vocation.

Premises become empty, and until they are occupied again (in a great number of instances they run into months and years) the closet and other traps, including interceptors, have no water passing through them, unless by accident some individual, as an intending tenant or purchaser, pulls the lever of a water waste preventer (if the water is still on, or the main cistern not emptied) the traps are all empty through evaporation. Should they be standing with water, it becomes fully charged with impurities; when it ceases to act as a seal, and is as bad and injurious to any one who is looking over the premises as if there were no traps; and empty houses being often closed up, the air becomes thoroughly saturated with sewer gas.

House agents I blame very much for this, as in most cases properties are placed in their hands, and they should see the traps are frequently flushed and charged with clean water; the more so as many of them aspire to be architects, surveyors, sanitary engineers, and builders also. They should be compelled by law to flush all drains at least twice per week.

Only a short time since, in London, I was inspecting some property for the necessary repairs, and I had to leave the premises without finishing on account of the overpowering atmosphere; and this is only one of the many similar experiences I have had.

It seems a very necessary duty of all agents or others interested in property to secure adequate ventilation while keeping all the windows sufficiently closed to guard against bad weather.

I am not at all delicate, but I certainly think something ought to be done to prevent this sort of thing occurring.

My remarks apply equally to every drain trap outside the house, which at times, especially in hot and dry weather, and where there is a separate rain-water drainage system, lose their water seal; and if the surface and soil both run into the sewer, it then happens that any gases have free access into the open yards of houses as well as inside. It certainly cannot, to say the least, do much good to anyone to sample them. If there is no hurt, we can very well dispense with traps and interceptors entirely.

Some people may say the ventilating shafts will carry all this off, but I think a great number of practical people will agree that so many shafts are fixed in such a position that in the summer time they are next to no good (if any are fixed at all).

WM. BRETT.

CHARGES FOR COMPETITION INSTRUCTIONS.

SIR,—I send you enclosed an answer to a letter of mine to some competition promoters saying that I would send 1*l*. 1*s*. if they would return the deposit if I refused to compete within a fortnight.

Now, this point of deposits for competitive conditions wants reforming. At the best it is a clumsy method of saving trouble to the promoters. A competitor has to write out a cheque, and if he does not compete receives another cheque on his returning particulars, all to prevent the promoters from having to send a few particulars which may not be used. In a case like this it is simply made a leap in the dark, for how can any man come to a decision as to whether he will compete until he has read the conditions? And I suppose few men, even if they are well off, care to throw away a guinea.

I think a reform is possible on these lines. Let every one who thinks of competing send an addressed envelope and pay 1*s*., which would certainly more than cover the cost of printing competitive particulars; but some reform is certainly urgently needed. This is the second competition I have let go by in six months, because I do not care to forfeit a guinea without having the means of judging if the conditions are reasonable.

W.

The Student's Column.

RURAL DRAINAGE.—XIII.

ALL manholes, lampholes, flushing chambers, and other accessories must be constructed as the sewers proceed, and provision must be made in the same manner for house drain connexions. The principles to be adopted in the construction of junctions are:—

1. Branch sewers or drains must discharge into main sewers in the direction of their flow.

2. The velocity of the discharge of the branch sewers or drains must not be less than the velocity prevailing in the main sewer.

3. "Branch sewers or drains should have a fall into the main sewer at least equal to the difference in the sectional diameter." ("Rawlinson's Suggestions.")

It is a well-known fact that when the velocity of a liquid carrying matter in suspension is checked, there is a tendency towards deposit. This principle has been one of the most important factors of geological history, and the same cause which has obstructed a sewer has formed a mighty delta. The worst form of junction (except where the tributary drain points up stream, a condition of affairs occasionally met with) is a right angle, either horizontal or vertical; an oblique junction is an improvement; but the proper form is a curve of as large a radius as possible. A slightly increased fall is frequently given to the curved portion of the drain in order to neutralize the additional friction. Where there is a considerable difference between

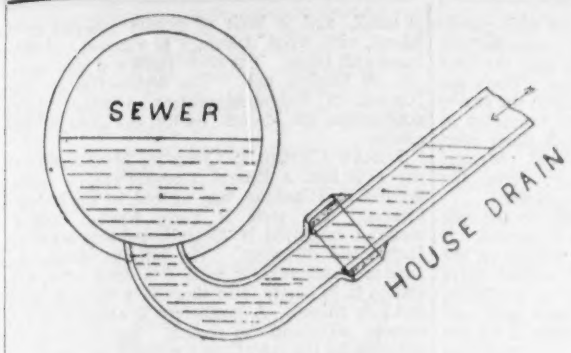


Fig. 27.

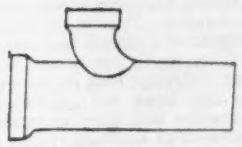


Fig. 28.

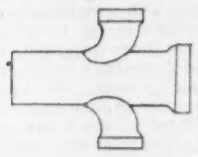


Fig. 29.

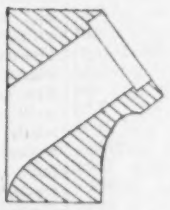


Fig. 30.

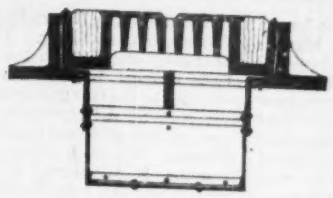
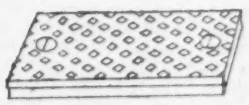


Fig. 31.



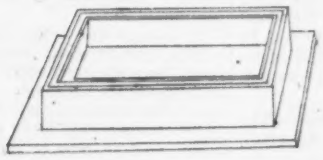
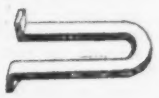


Fig. 32.



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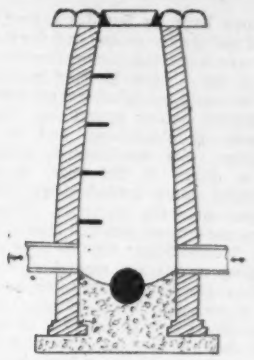

Fig. 34.

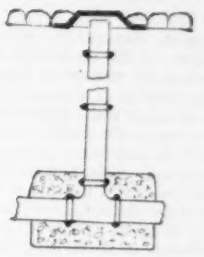

Fig. 35.

the diameter of the main and subsidiary sewer or drain, it will be sufficient if the junction is made in the upper half of the main sewer—the object being that the mouth of the tributary channel shall not be obstructed by the flow in the main sewer. If the contents of the tributary drain fall upon the surface of the liquid in the main sewer, a reduction of velocity and a tendency to deposit will be the result. Perhaps the best construction is where the invert of the tributary sewer or drain is at the surface level of the normal flow in the main sewer.

Mr. Baldwin Latham ("Sanitary Engineering," p. 283) favours a lower position. He says: "the proper position for a junction is within the water-line, but not so low that the flow from it would be checked by the sedimentary deposit that will be rolled along the bed of the sewer. It will be seen that when junctions are so placed that the outfall of a house-drain will be below the water line, the drain will be trapped at its outlet, ..." A system embodying an extreme view has been invented and patented by Dr. Illingworth and entitled "A New System of Sewerage." In this system it is proposed to make the junctions at the invert level of the main sewer (fig. 27), and the advantages claimed are: "Firstly, the removal of the offensive odours emanating from sewers through street ventilators, &c.; and, secondly, the complete separation of the drain air of each house from the sewer-air, thus preventing all danger of infection through the agency of sewers, even when the house-drain traps are out of order or absent altogether." As this idea appears to be so much at variance with all preconceived principles, and as the advantages claimed for it are attainable by other and more rational methods it is unnecessary to discuss it further.

Stoneware pipes are especially made so as to facilitate the construction of junctions, and almost any curve is obtainable.

Fig. 28 is for a single junction, and

Fig. 29 is for a double junction for drains on opposite sides of the principal channel.

Junctions with brick sewers should be made by means of junction blocks built into the sewer.

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GENERAL BUILDING NEWS.

WEST HIGHLAND COTTAGE HOSPITAL, OBAN, N.B.—This hospital, which has recently been opened, is on an eminence on the Glencruitten Estate, near Oban. The building, which is treated in the cottage style, suitable to the locality, is at present for the accommodation of twelve beds, besides two private wards and nurses' accommodation. The building is so arranged that, with but very little difficulty, nearly double the capacity can be given to the public wards when extension becomes necessary. It is of Bonawe granite, with freestone dressings; the ridges are of red tiles, and the chimney pots are of the same material. The large wards are heated with Shoreland "Manchester Grates," and the other grates, kitcheners, &c., have been supplied by Messrs. Graham and Morton, of Stirling. Messrs. D. and A. Munn, Oban, were the contractors for the mason and joiner work, the other works being let as follows, viz, plumber, Mr. D. Crawford; plasterer, Mr. D. McCallum; slater, Mr. W. Proctor; bells and gas, Mr. J. Campbell; painter, Mr. Alex. Grey, all of Oban. The architect was Mr. G. Woulfe Brenan, of Oban, whose designs were selected in open competition.

MUNICIPAL BUILDINGS AND TOWN HALL, CHATHAM.—A large block of buildings, to be utilised as Municipal Offices, Town Hall, and Council Chamber, is shortly to be erected at Chatham; it is expected that the work will be commenced at the end of the present year, and the foundation stone laid next March. As at present designed by Mr. G. E. Bond, the building will be in the English Renaissance style, with facings of Monk's-park ashlar, with Portland stone dressings and weatherings. The clock-and-bell tower will have a height of 126 ft. The accommodation will be as follows:—Ground-floor: Principal entrances on the corner leading to a spacious hall containing the grand staircase, which will be of marble, offices for Town Clerk, Town Clerk's Clerk, Borough Surveyor, Surveyor's Clerk, Borough Accountant, Rate Collector, Inspector of Nuisances, School Attendance Officer, large committee room (this room, which will be 45 ft. by 23 ft., is connected by a staircase with the large Town Hall, and may be used as a supper or refreshment room) small committee-room, waiting-room, store-room, strong-room, and cloak-room, also good lavatory accommodation. In addition to the principal, there are four other entrance doors for special convenience of other parts of the building. Principal floor: Large Town Hall, 90 ft. by 45 ft., with ladies' and gentlemen's retiring rooms in the rear of, and at the level of the platform. The roof will be partly open, with trusses arranged in pairs, filled in with turned balusters, and springing from rouge marble columns, on carved corbels, window frames, mullions, transoms, &c., of stone, glazed with leaded lights. Across the end of the hall facing the platform will be a gallery to accommodate about 150 persons. In addition to the principal staircase, there are two other stone staircases at the rear of the hall for entrance and exit. Above the retiring room in the rear of the platform is a large room for an orchestra, having an arched opening, 28 ft. wide to the hall. This, it is suggested, may be used for an organ chamber in the future. The Council Chamber will be 42 ft. by 30 ft., with coved and panelled ceiling, with walls broken

up into bays by fluted pilasters. It is to have a small gallery across one end for the public. Mayor's parlour: A handsome reception room, 30 ft. by 17 ft., facing the Upper Drawbridge-road. The ceiling will be coved, panelled and moulded, and is to have a parquet border round the floor. On this floor is also a cloakroom, and a well appointed lavatory. On the landing, which will be lighted by a dome in the roof, is an arcade with casement doors behind giving access to the open balcony over the entrances. This will constitute a promenade when the hall is used for bazaars, balls, &c. Second floor: On this floor are the living and sleeping rooms for caretaker, viz., living room, scullery, larder, two bedrooms, and a store room in the tower, with usual offices. Basement: Large room in front 38 ft. by 16 ft. to let for small meetings, &c. There are also rooms for engine and dynamo, heating, &c., a large kitchen and scullery, with lift up through the supper room to the Town Hall, and a number of other store rooms, the whole of the basement being excavated. Heating will be by low pressure hot water, with ornamental radiators. The building and site will cost, it is estimated, a little over 20,000*l.*

CHURCH, SAUGHALL, NEAR CHESTER. — The dedication of the church of All Saints, Saughall, took place on the 22nd inst. The plan of the building consists of a nave, with north aisle of four bays; chancel, with organ-chamber on the north, and vestries on the south; a west-end central baptistry, and a south-west porch. The nave is 54 ft. long and 24 ft. wide, and the floor slopes up slightly towards the east. There is a low well between the nave and the chancel, bayed out into the south-east angle of the nave, to form the base of the pulpit. The chancel is 26 ft. long and 18 ft. wide, with apsidal east end. Over the western portion of the chancel is arranged a low tower, with a broached spire covered with shingles. The walls of the church are faced outside and in with red brick, with a dado inside the nave of brown glazed bricks. The sills and dressings are of terra cotta. The open timber roofs are boarded inside, and covered outside with tiles. The portion so far erected is the nave, with the baptistry and south-west porch, temporary walls being built east of the chancel arch, and in the arches of the north arcade. This portion has cost about 1,300*l.* The contractor was Mr. W. W. Freeman, of Chester, and Messrs. Haden & Sons have executed the work in connexion with the heating. Mr. Medland Taylor, of Manchester, was the architect.

SCHOOL BUILDINGS, LARKHALL, N.B. — The academy, erected by the Larkhall School Board at a cost of over 7,000*l.*, was formally opened on Saturday, the 19th inst. It is situated in Union-street, adjoining the present academy. The style is a free treatment of Scottish Renaissance The different fronts are varied in treatment, and the gablets of the upper floor, with the ventilating turrets, form an effective sky-line. The walling is of local freestone, and the slating of Buttermere light green slates, with red ridge tiles. Internally the school is planned upon the central hall principle, comprising a series of class-rooms, varied in size to suit the different standards, grouped on two floors round a central hall, to which each section of scholars have separate access, and there are separate stairs to the upper floor. Accommodation is provided for 798 scholars. The plans are arranged, however, with a view to a future extension of the school to 1,100 places. The total cost of the building is expected to be under 8*l.* per head. The architect is Mr. John B. Wilson, of Glasgow.

HOLY TRINITY CHURCH, TORQUAY. — This church was consecrated on the 17th inst. The building is practically complete, the seating accommodation alone remaining to be finished. The style adopted is Early English, with a slight introduction in a few of the windows of tracery belonging to the Transition period. The most striking features are the tower and spire, which stand at the north-west corner. The tower rises from the ground to a height of 73 ft. It is crowned with a parapet, from which springs a spire to a height of 92 ft. This parapet is of pierced open Bath stone, and a Bath stone pinnacle stands at each of the four corners. From these spring flying buttresses of the same material, which support the spire. The tower has three stages. The first forms the principal entrance to the church, which is gained thorough a moulded Bath stone doorway, with sliding oak doors. The next stage is the ringers' chamber, which is reached by a staircase constructed in the tower wall, which ranges from 7 ft. to 9 ft. in thickness. The belfry forms the third stage. Above this point the tower changes from the square into the octagon to receive the base of the spire. The building consists simply of nave, north and south aisles, two transepts, and chancel with apsidal end. The roof principals at the entrance to the chancel are supported upon Ashburton marble columns, while the corbels upon which the main roof principals rest are of Bath stone, with columns of Petitor marble, supplied by Messrs. Blackler & Sons, of St. Mary-church. These, together with the intermediate Bath stone corbels, are in rough block, for future carving. The aisles are divided from the nave by Bath stone arches and piflars. The pulpit, designed by the architect, is composed of seven different kinds of marble from Ashburton, Petitor, and other Devonshire quarries, with panels of Derbyshire alabaster. The steps approaching the chancel are of Ashburton marble, and the floor of the chancel is laid with red tiles. There are entrances to the two transepts and one at the south-west corner. All the doors with the exception of those at the principal entrance, which slide, open outwards. The total cost is about 9,000*l.* Messrs. Vanstone & Mumford, of Torquay, were the builders, and Mr. John Watson the architect.

COTTAGE HOSPITAL, HARROGATE.—On the 19th inst. a new wing of this hospital was opened. It will accommodate nine beds. It is heated on the low-pressure hot-water principle. A central tower has been erected, and new bath-rooms, lavatories, ward kitchens, and operating-room have been provided. Off-duty rooms and new bedrooms for the staff have also been built at the head of the building. The total cost of the new works was estimated to be about 2,700*l.* The architect was Mr. Marshall, of Harrogate.

HYDROPATHIC ESTABLISHMENT, WEST KIRBY. —This new building, erected in place of an older establishment closed some years since, was opened on Monday the 14th inst. The site has an area of nearly two acres, with a frontage to Banks-road. A flight of stone steps leads into an outer vestibule or porch, and the latter is connected with the central staircase hall, corridors being arranged right and left. Those on the right lead to the dining-room and a large assembly-hall. The serving-rooms are placed at the back, and connected with the kitchens in the basement by a service-lift. The drawing-room adjoins the dining-room, and it is entered by two doors from the main corridor. The left-hand corridor on the ground floor leads to the reception-room, office, and doctor's apartment, and at the end of this is a large smoking-room, furnished in oak. A wide and short flight of stairs from the central hall leads to the billiard-room. The baths, which form a special feature of the buildings, are situated in close proximity to the hall. They contain a cooling-room, fitted up with couches, and communicating direct with a plunge-bath, shampooing-room, with needle bath, and three hot-rooms, fitted up with marble slabs. There are also private slipper-baths and dressing-rooms, a German bath and dressing-room, also a vapour-bath and Sitz-bath. The walls are lined with glazed ornamental tiling, 5 ft. high. The floors and plunge-bath are also tiled. The floor over the baths is constructed of iron and concrete. The sanitary block adjoins the baths. Private slipper-baths are also provided on each floor, whilst the floors are tiled and the walls have tiled dados. On the first and second floors are the private sitting and bed rooms. The latter are spacious, well lighted and ventilated, and accommodation is provided for 50 beds for visitors. The kitchen and servants' rooms occupy the basement. A passenger lift, worked by hydraulic power, connects the ground and first and second floors, and adjoins the main staircase. It has been supplied and fitted up by Messrs. E. Blake Smith & Co., hydraulic engineers. The place is lighted entirely by the electric light, generated by a large compound shunt wound dynamo, arranged for running the whole of the lamps direct from the engine. The plant includes a number of E.P.S. cells of large capacity, which can be charged when the dynamo is not required for lighting purposes, thus providing double plant. The steam boiler in the engine room, which is placed outside the main building, supplies the baths, kitchens, and heating apparatus. Messrs. Leech Brothers, of Manchester, have fitted up the Turkish baths, kitchen arrangements, and heating apparatus. A sea water main has been laid down, with a large tank provided on the sea shore, from which the water is pumped and filtered, and conveyed to tanks provided in the towers. Salt water is supplied to all the baths. In regard to ventilation, Tobin tubes and Sheringham outlets are provided for the various rooms; two main exhaust shafts are also placed over the main corridors on the roof. The builders were Messrs. Thornton & Sons, of Liverpool, their contract being over 6,000*l.* Mr. Ewing, Liverpool, did the plumbing, and Messrs. Tanner the slating and plastering, while Mr. G. Ewing Johnston, of Seel-street, Liverpool, has had charge of the electrical work. The architects were Messrs. Alfred Darbishire and F. Bennett Smith.

PROPOSED NEW THEATRE, RICHMOND (SURREY).—The Highways Committee of the Richmond Town Council have just decided to recommend the Council at their next meeting to approve of the plans of a theatre proposed to be erected at Richmond by the Lyceum Company, Limited.

MEMORIAL CHAPEL, PENDINE. — A chapel erected to the memory of Peter Williams at Pendire, in Carmarthenshire, was opened on Wednesday, the 16th inst. The building is of an unpretentious character, and has been erected at a cost of about 400*l.* It is almost square on plan. The front is of limestone with yellow brick facings, the other three sides being plastered. The architect was Mr. Morgan, Pendine, and the contractors Messrs. David Rees & Sons, of Whitland.

CHURCH, LUNDY ISLAND, BRISTOL CHANNEL. —We understand that the church erected on Lundy Island is almost finished, and is expected to be consecrated in the latter part of October. The church is small, and is built of granite quarried on the island, with stone dressings to windows and doors, lined with brick. The choir stalls and reading-desk are of English oak. The architect is Mr. John Norton, of Ridgmont-gardens, London, and the contractors are Messrs. Button & Pickett, of Ilfracombe.

ROMAN CATHOLIC CHURCH, MINEHEAD.—On the 15th inst. a Roman Catholic church recently erected at Minehead was opened by the Bishop of Clifton. The style is Early English, and the material employed is Alcombe red sandstone, with Bath stone dressings. The interior, divided into nave and sanctuary, is 57 ft. 6 in. long, 18 ft. wide, and 33 ft. in height, and there is a sacristy, porch, and lady chapel. A presbytery is about to be commenced adjoining the church. The building was designed by the Rev. Canon Scholes, of Yeovil.

RESTORATION OF ST. MICHAEL'S CHURCH, HONITON.—This church has recently been reopened after extensive restoration. It is in the Perpendicular style, and consists of a chancel and nave, with north and south aisles, north porch, and western tower. The chancel is divided from the nave by an oak screen. The high pews and galleries which formerly existed have now been taken away, and the whole of the stonework of windows, arches, piers, &c., restored. The floor space has been covered with concrete, and the aisles with oak block flooring. The church is re-seated with open benches of Riga wainscot oak, with portions of the old oak re-used. The old plastering has been stripped off and the walls re-plastered, and the ceilings of the north and south aisles have been restored. The building is heated by Grundy's hot air system from a chamber built underneath. There is also a new altar and credence table of oak. The latter were made by Mr. Herbert Read, carver, of Exeter, from the designs of the architect. The builder was Mr. Turner, of Honiton. Mr. E. H. Harbottle, of Exeter, was the architect.

WESLEYAN CHURCH AND SCHOOLS, STANDISH. —This building, the memorial stones of which were laid the other day, consists of a church with school-room, infants' room, four class-rooms, kitchen, &c., adjoining. The principal entrances to the church are to the front, a spacious outside porch or vestibule being provided. At the opposite end the rostrum and communion will be placed, the base of the rostrum being constructed of moulded and panelled framing, the centre portion above the floor also being of moulded and panelled framing, whilst the remainder of front will be formed of turned newels and handrails filled in with ornamental wrought iron panels. The floor of the church is inclined. The schoolroom is placed at the rear of the church; separate entrances are provided for boys and girls. Two of the class-rooms, by means of revolving shutters, can be thrown open to the schoolroom when required for assembly purposes, giving a room 54 ft. 4 in. long by 30 ft. wide. The ceilings of the church and school are partially "open," being ceiled at the collar beams. The church is faced externally with Accrington plastic bricks and Yorkshire stone dressings; the internal joinery is principally of pitch-pine, varnished, a great portion of the glazing to church windows will be in lead lights to special designs. The heating is to be hot-water, low pressure. The church will seat 350 adults, or a mixed congregation of 400 persons. The schools will give accommodation for about 400 scholars. Mr. W. H. Dinsley, of Chorley, is the architect and Mr. J. Wilson, of Wigan, the builder.

GROVES NEW MISSION HALL, HULL.—The memorial stones of the above building were laid on Thursday, September 17. The buildings, now in course of erection, are situated upon a good corner site at the junction of Jenning-street with Clevelandstreet, and comprise an assembly hall 53 ft. 6 in. long by 36 ft. 6 in. wide, with balcony round to accommodate 600 persons. It is approached by spacious entrances from Jenning-street, and surrounded by twelve classrooms, library, kitchen, &c., on the ground floor. A large junior school and vestry are planned at the rear with entrance from the side street. On the first floor are large class-rooms for young men and women. These, as also several of the classrooms on the ground floor, are so arranged that each can be used independently for class meetings, &c. The hall will have a partly open pitch-pine timber roof and will be lighted from above by continuous clearstory, which will be glazed with leaded lights. The walls will be faced with Lincolnshire red bricks and Yorkshire stone dressings. The tracery windows will be in Ancaster stone, the inside woodwork of red deal and Californian red wood. The buildings are being carried out by Mr. E. Good, the architects being Messrs. Gelder & Kitchen, of Hull.

IMPROVEMENTS AT DERBY.—A Local Government Board inspector held an inquiry at the Guildhall, Derby, on the 16th inst. into the application of the Town Council for sanction to borrow 636*l.* for the erection of stables in the Ford-street yard, 800*l.* for widening King-street, and 120*l.* for purposes of technical instruction.

SCHOOL BUILDINGS, SWANSEA.—On the 10th inst. the school buildings recently erected by the Swansea School Board at Brynmill were opened. They consist of a two-story building giving accommodation for 1,086 children, and are planned on

the central-hall system, with separate halls for each department, viz., infants, girls, and boys. The two former departments are arranged on the ground floor of the building, approached from the playgrounds by two entrances to each giving direct access to the halls; cloak-rooms, lavatories, and teachers' rooms are placed on either side of the entrances on one-story buildings extending the whole length of the infants' and girls' halls on the south front. These halls are capable of being converted into one large room by means of a folding partition. The infants' assembly-hall is 45 ft. long by 33 ft. wide, and has arranged on two sides other rooms for the accommodation of 366 scholars. The girls' assembly-hall is 60 ft. long by 33 ft. wide; a schoolroom and four class-rooms are placed on two sides of the hall; one of the small rooms is fitted up as a cookery room, and has a scullery and larder adjoining, the whole giving accommodation for 380 girls. The boys' department is approached from their playground on the north side of the building by two entrances, with cloakrooms, lavatories, and teachers' room on the ground floor level, arranged in a similar manner to those for the infants and girls. Two stone staircases arranged into easy flights give access directly into the boys' assembly-hall, 60 ft. 6 in. long by 33 ft. wide, with six class-rooms arranged on three sides of the hall. Separate offices, play-sheds, and playgrounds are provided for each department, and the latter are tar paved and enclosed with iron railings. The school is constructed with bricks, with Graig brick facings and Bath stone dressings; the roofs are covered with slate, and the floors are formed with steel and concrete, and covered with wood blocks. A large oak turret surmounts the main roof, and is utilised for ventilation. The whole of the rooms are warmed with hot-water pipes, and radiators and fireplaces are also provided in the class and school-rooms to assist the heating and ventilation. The total cost of the school, including site, paving footpaths, furniture, &c., will be about 15,000*l*. The contractors for the building were Messrs. Lloyd Brothers, of Swansea; Mr. D. Evans acted as clerk of works, and the architect was Mr. G. E. T. Laurence, of London.

SANITARY AND ENGINEERING NEWS.

ELECTRIC LIGHTING, BOLTON.—At a meeting of the Bolton Corporation on the 18th inst. it was decided to spend an additional 30,000*l*. on the extension of works and plant for electric lighting.

WATER SUPPLY, NORTH TAWTON.—On the 16th inst. a Local Government Board Inspector held an inquiry respecting a proposed loan of 2,500*l*., applied for by the Okehampton District Council for the purpose of improving the water supply of the town. The Clerk for the promoters, of the scheme said the population of the parish was 1,737, and of the area to be supplied 1,200. The assessed rateable value of the parish was 8,372*l*., and of the area 1,550*l*. The only loan outstanding against the parish was a sum of 380*l*. for sewerage works. No objections had been raised to the proposed application. The town was supplied by the North Tawton Water Company, which was established in 1852, and had not been registered. In consequence of representations made to the District Council early in 1895, that body called in an engineer (Mr. Harry Geen, of Okehampton), who was there that day to explain the proposed scheme. Not only was the water supply insufficient for household purposes, but the new scheme was absolutely necessary for sanitary purposes. The Water Company were prepared to sell their plant and rights to the District Council for the sum of 402*l*. 10s. The offer had been approved both by the parish at a special meeting and by the Parish Council.

WATERWORKS EXTENSION, HUDDERSFIELD.—At a meeting of the Huddersfield Town Council on the 16th inst., Alderman Crosland, the Chairman of the Waterworks Committee, gave some interesting statistics as to the waterworks. The daily supply at present was 5,250,000 gallons; but, taking a term of years, the average daily supply was 4,750,000 gallons. Of the daily supply 2,194,875 gallons went for domestic consumption, and 1,766,000 gallons for manufacturing purposes. Up to the present month 131,280*l*. had been expended on Butterley reservoir, and the engineer, Mr. Crowther, estimated that another 50,000*l*. would have to be spent on the reservoir, which was expected to be completed at the end of 1898. When Butterley reservoir was completed it would give a supply of 3,500,000 gallons per day, and it was intended that of this 1,250,000 gallons would go for domestic purposes, and 2,250,000 gallons for compensation to the valley. The Corporation had bought the whole of the Wessenden Valley for waterworks purposes for 50,000*l*., and he thought it would be advisable to start the construction of the proposed Blakeley reservoir at an early date. That reservoir would cost 35,000*l*., and would hold 80,000,000 gallons.—*Leeds Mercury*.

ADDITIONAL WATER STORAGE, PETERHEAD, N.B.—At a recent meeting of the Water Committee of the Peterhead Town Council, a report by Mr. Watson, county engineer, with regard to additional water storage, was submitted. He reported that, owing to the past two dry winters, there had been an exceptional shrinkage of springs this summer. The Council had not been able to acquire all the springs he recommended in 1894, and there had been great difficulty in keeping up a constant and equal supply during the day. After discussing the probable contingencies arising out of an excessive demand, Mr. Watson stated that he had no hesitation in advising an increase of the size of the service reservoir (which contains little more than one day's supply). Referring to the impounding of the surplus water from the Cairncatta springs during the wet season, and presuming that it would fill a reservoir capable of holding from 7,000,000 to 10,000,000 gallons, he would recommend the Council to construct such a reservoir. He would estimate the cost of making a 1,000,000 gallon reservoir at about 700*l*., and an 8,000,000 gallon at about 2,000*l*., including cost of land. In the event of the Council agreeing to construct a new reservoir, Mr. Ferguson's plan of laying a new 6-in. pipe from the Grange reservoir to the Wellington main would be absolutely necessary to obtain the full benefit of it from the work. Concluding, Mr. Watson said that if the Council could obtain an additional supply of water from Graystone, and intended to obtain it, the reservoir he contemplated would be a service reservoir only, limited to contain 1,000,000 gallons, or about three days' supply for the present population; but if, on the other hand, it was not intended to increase the Wellington section of the works, he would recommend the construction of a reservoir at Berryhill, large enough to impound all the available surplus water from the Cairncatta system. The water committee, after considering the report, recommended the construction in the meantime of a reservoir to hold 1,000,000 gallons, but to take off sufficient ground to enable a duplicate to be constructed when thought necessary, the clerk being instructed meantime to ascertain from the proprietors of Forehill on what terms they would feu a site to the extent of about an acre. At subsequent meetings of the committee, the negotiations with the North of Scotland Bank, the proprietors of Forehill, were discussed, including an offer to sell a site; but the final consideration was deferred.

WATERWORKS EXTENSION SCHEME, GAINSBOROUGH.—Mr. Henry Riley, engineer and surveyor to the Urban District Council of Gainsborough, has prepared a report upon the second section of the waterworks extension scheme. The whole scheme, as projected by the late Local Board, is of a very complete and comprehensive character. The first section, now in hand, includes a bore-hole 1,450 ft., with a new engine-house containing the necessary pumps and engine. The second section of the scheme, which is now under consideration, includes a service reservoir, water tower, and a new pumping main. The existing service reservoir on Summer Hill has a capacity of 656,176 gallons, and the new reservoir will hold 1,004,350 gallons. Mr. Riley's instructions were to make the top water-level and the depth of the new reservoir the same as those in the old; but on taking levels, &c., he found it would be better and more economical to construct the reservoir 16 ft. deep than to make it the depth of the old one—an average of 13 ft. 3 in. By making the reservoir 16 ft. deep, an average depth of 5 ft. of excavated material at once becomes available for embankment purposes, thus providing 2,077 cubic yards of the 3,443 cubic yards of material required for the banks, leaving only 1,366 cubic yards to be obtained elsewhere. The difficulty of obtaining 2,077 cubic yards of material in the neighbourhood for the banks of the shallower reservoir would have very materially increased the cost of its construction. Trial holes have been sunk in five different places, and the engineer is satisfied that the reservoir will rest on a firm foundation. It is proposed to give the high level district a constant water supply by erecting a water tower between the old and new reservoirs, which will be of such a height as to command the highest point of the district. The tower will consist of an iron tank supported by, and enclosed within, a brick building. The engineer recommends that a 14-in. pumping main be laid. This pipe will be more than three times the size of the old one. He suggests that the water tower be put in hand as soon as sanction is received from the Local Government Board, in order to improve the supply to the high level district as early as possible, as that part of the scheme can be carried out in conjunction with the old pumping main. The new pumping main might also be laid during the winter months; and the contract might also be let and preparation made to carry out the reservoir early during the summer of 1897. In conclusion, he stated that he has gone very carefully into the question of the cost of carrying out the scheme, and his estimate (exclusive of land) amounted to 5,800*l*.

WATER SUPPLY, KINGSTEIGNTON.—A Local Government Board Inspector held an inquiry on the 15th inst. at Kingsteignton concerning a proposed loan of 2,500*l*. for the purpose of giving the village a better water supply. The Clerk of the Rural District Council, in laying the scheme before the Inspector, said the population of the parish was 1,808 at the last census, and the assessable value was 6,921*l*., the balance of outstanding loans amounting to 164*l*. 9s. 8d. Various schemes of water supply had been promoted, and the present one proposed to commence at Holywell spring, in Ugbrooke Park. The spring gauged in October of last year yielded 259,000 gallons a day, and the water would be sent four miles through a 4 in. main to the centre of the village, whence it would be conveyed to consumers by 3 in. distributing mains. With such an abundant supply a storage reservoir was not required, although a supply reservoir of 50,000 gallons was included in the scheme, the cost of which, after allowing for compensation and legal expenses, amounted to 2,175*l*.

ANDOVER.—The Corporation of Andover have had an order for an injunction given against them to restrain them from polluting the River Anton, and have instructed Mr. Edward Tidman, C.E., F.S.I., Westminster, to report to them as to the best practicable means to be adopted to prevent the discharge of sewage into the river, and further disposal of the same, to satisfy the requirements of the Local Government Board. Mr. Tidman has already commenced his investigation.

OPENING OF WATERWORKS, MASHAM, YORKS.—The works of water supply that have been under construction for some time are now completed, and were opened the other day. It is estimated that they will supply double the present population of Masham, Healey, Fearby, and Fearby Cross, which are on the route of the supply. At Agra, six miles from Masham, is the collecting reservoir, into which the water of three springs is directed. The water is collected into a brick chamber, and taken into the covered storage reservoir, which is constructed in Portland cement concrete, with an inner lining of superior concrete (blended to the backing as the work proceeded), rendered in the face with neat cement, and provided with the usual overflow and washout pipes and valves for controlling the supply. The roof of the reservoir is of self-supporting corrugated galvanised iron, securely bolted to wall plates. The gables are built up with stone-work, and are provided with Louvre doors for ventilation. Any surplus water beyond that actually consumed is returned to the original watercourse. From the reservoir the water is conducted to Masham in 5 in. and 4-in. pipes, and is provided with stop valves, &c., in suitable positions. A pressure reducing tank, with overflow and by-pass, is fixed between the 5 in. and 4-in. main after it leaves Fearby Cross, in order to reduce the pressure on the mains in Masham to a reasonable head. In the town of Masham the water is distributed by 4-in. and 3-in. mains, with the necessary valves, hydrants, &c. The capacity of the reservoir is 30,000 gallons, and the supply per 24 hours is estimated at 87,000 gallons. The system is by gravitation, and the estimated cost is under 4,000*l*. The engineers were Messrs. Fairbank & Sons, of York and London, and the contractor Mr. Thomas Bell, of Market Weighton.

SEA WALL, PENZANCE.—The sea wall at Penzance, is now virtually finished. It commences immediately to the west of the old baths, and then runs eastward as far as the old promenade, for a length of 737 ft. In the new work is provided a lower promenade at the level of the eastern end, which is 8 ft. below the surface of the existing front. This promenade is approached by steps at the western end, and in the centre are steps which form a means of easy access to the beach. From these steps there is a slip-way 30 ft. in length which will enable vehicles used for the conveyance of invalids and children to be conveyed down to the beach. This slip may also be utilised for the bringing-up or taking-down of bathing machines and will be a most convenient addition to the esplanade. The wall is built of granite, with ashlar facings and Portland cement backing, and the foundations are taken down through the beach until clay is reached, at which level the wall attains a thickness of about 17 ft. 6 in., with the foundation carried out 4 ft. to 5 ft. in the clay and 12 ft. wide. The total depth from the level to the beach with the foundation is about 11 ft. 6 in. Cast-iron standards 5 ft. 3 in. and 4 ft. high of a hexagonal pattern will be erected on the coping of the upper and lower walls, and the railings will be composed of two bars, one 1½ in. and the other 1¼ in. This protecting ironwork will be continued the whole length of the promenade as far as Sandy Bank. The work has been carried out under Mr. George H. Small, Borough Surveyor and Engineer, and Mr. W. J. Nicholls was clerk of the works.

FOREIGN.

FRANCE.—The scaffolding of the Arc de l'Etoile has after all, been removed for the occasion of the Czar's visit.——M. Dardenne, of the Ponts et Chaussées department, has been commissioned to undertake the construction of a new bridge at Nogent-sur-Marne, at a cost of 950,000 francs.——A competition has been opened at St. Malo for the best scheme for a water supply to the town.——M. Léopold Lebrun, architect, of Poitiers, has been appointed by the Government as architect in charge of the numerous "Monuments Historiques" in that town.——It is proposed that the first stone of the new Invalides bridge over the Seine should be laid on the occasion of the visit of the Czar.——A new square is to be formed at Montmartre, at the northern extremity of the hill, between Rues De Maistre, Marcadet, and Carpeaux, on a site which will admit of very picturesque treatment.——There

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
* Designs for Municipal Buildings	Douglas Corporation..	40l. 20l. and 10l.	Nov. 21

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Additions to School, Felling, Durham	Heworth School Board	H. Miller, Board Offices, Felling.....	Sept. 29
Sewage Disposal Works	Bredbury (Cheshire) U.D.C.	J. W. Bain, Council Offices	do.
House, Hunmanby, Yorks.....	W. Parker.....	S. Dyer, Archt. Bridlington Quay.....	do.
Alterations to Police Station, St. Philip's, &c.	Bristol Corporation ..	J. Thomas, City Surv. 51, Princes-street ..	do.
Schools, Comerswell-road	Penarth School Board	J. H. Pallips, Archt. 34, John's-chambers, Cardiff	do.
Gate Lodge, Bridge Mills, Kendal	J. Thompson & Co. ..	S. Shaw, Archt. Kendal	Sept. 30
Two Houses at Sewage Works.....	Ipswich Corporation..	Mr. Buckham, Boro' Surv. Town Hall	do.
Stoneware Pipes	Burton-on-Trent Corp.	J. E. Swindlehurst, Boro' Engineer	do.
*Factory, Caretaker's House, &c. Coventry	H. Williamson, Lim.	H. W. Chattaway, Archt. Trinity-chrchyd, Coventry	do.
*Broken Granite	Slough U.D.C.....	J. Baker, Mackenzie-st. Slough	do.
Distillery, Cameron Bridge, Elgin, N.B.	.....	C. C. Doig, Archt. Elgin..	do.
Warehouse and Offices, North West-road, Leeds	Jackson's, Limited ..	J. Charles & Sons, Archts. 98, Albion-street, Leeds	do.
Laundry, Stables, &c. Bognor-road	Chichester Steam Laundry Co. Lim.....	G. C. Vernon-Inkpen, Surv. Chichester	Oct. 1
Paving, &c. Duke-street, Gateshead Improvement Works, Colebrook-terrace	.....	J. Bowes, C.E. Boro' Surv. H. L. Staffurth, Clerk, Bognor.....	do.
Alterations to Fish Market, Baldwin-street	Bognor U.D.C.	J. Thomas, City Surv. 51, Princes-street	Oct. 2
Sewers, &c.	Bristol U.S.A.....	A. Hawes, Council Offices	do.
Waterworks, Gordon	Bakewell R.D.C.....	Thomson & Wright, C.E 22, Rutland-sq. Edinburgh	Oct. 3
Sewerage Works, Childer Thornton, Cheshire	Berwick C C.	Beloe & Priest, 13, Harrington-street, Liverpool ...	do.
Workhouse Buildings.....	Wirral R.D.C.....	E. M. Longdon, Archt. Town Hall	do.
Assembly Rooms, &c. The Poplars, Crewe	Bakewell(Derby)Union	A. G. Hill, Sec. Bank-bldgs, Market-street, Crewe ..	do.
Extension of Schools, Barton, Northwich.....	Crewe Conservative Club Co.	E. T. Ward, Archt. Winnington-st. Northwich ..	do.
Surveyor's Stores	.....	H. Dearden, Boro' Surv. Market-place	do.
Laundry at Workhouse	Batley Town Council	W. G. Brown, Archt. Weymouth-road, Frome	Oct. 5
*Boilers, Engines, Laundry Fittings	Frome Union	A. & C. Hurston, 18, Leadenhall-street, E.C...	do.
*Kerbing, Tarpaving, &c.....	Mct. Asylums Board	H. Harlock, Boro' Surv. Clarence-road	do.
*Laying 1,245 feet Pipe Sewer	Southend Corp.	do.	Oct. do.
*Levelling, Paving, &c. &c. Streets	do.	do.	do.
*Alterations, Town Hall	do.	do.	do.
School, Chyvelah, Cornwall	Leyton U.D C	W. Dawson, Town Hall ..	do.
	Kenwyn Sch. Board ..	S. Trevail, Archt. Truro .	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Passenger Station, Chalford, Glos. ..	G.W.Ry. Co.....	G. K. Mills, Paddington Station, London	Oct. 6
Additions, &c. to House and Police Station, Canterbury.....	.....	City Surveyor, 28, St. Margaret's-street	do.
School Extension, Caegarw, Mountain Ash, Glam.	Llanwonno Sch. Bd. ..	A. O. Evans, Archt. Pontypridd	Oct. 7
Whinstone road metal	Bedlington U.D.C.....	Mr. Cooper, Surveyor, Bedlington.....	do.
Wesleyan Church, Ilkeston, Derby ..	.....	G. Haslam & Son, Archts. Euclid House, Ilkeston	do.
*Sorters' Office, Reading Station	Commrs. H.M. Works	12, Whitehall-place, S.W.	do.
*Flight of Steps and other Works ..	Fulham Vestry	J. Botterill, Town Hall, Walham Green, S.W. ..	do.
*Granite, Flints, and Ragstone.....	Bexley U.D.C.....	The Surveyor, Council Offices	do.
*Alterations, School	Forest Gate School District	Superintendent at School	Oct. 8
*Flints	Southgate U.D.C. ..	C. G. Lawson, Council Offices, Parson's Green, N	do.
Houses, Glebe-road, Bromley, Kent ..	.....	F. & W. Stocker, Archts. 90, Queen-street, E.C. ..	do.
Additions to Town Hall.....	Brighton T.C.	F. J. C. May, C.E. Town Hall	Oct. 9
House, Tongrefail, Wales	Llantrisant Sch. Bd...	J. J. Evans, Archt. Sunnyside, Penarth	do.
*Erection of House.....	Kensington & Chelsea School District ..	C. Sharp, 59, Fenchurch-street, E.C.	do.
Two Stone Bridges, Bell Brook, Dorstone, Herefordshire	Breiwardine R.D.C...	C. Griffiths, Clerk, Hay, R.S.O.	Oct. 10
Road Works, Skircoat Green Estate, Halifax..	.....	Jackson & Fox, Surv. 22, George-street, Halifax ..	Oct. 14
*Fitting Padded Rooms	Camberwell Guardians	The Clerk	do.
*Infirmary.....	Merthyr Tydfil Union	C. A. Johnson, Abergavenny	Oct. 16
Waterworks	Larne (Ireland) Town Commrs.	J. H. H. Swiney, C.E. Avenue Chambrs. Belfast	Oct. 17
*Drawing and Stop Cocks	Southend Waterworks Co.....	Waterworks Office.....	do.
Works, Armley, Leeds	C. Wilson & Sons	W. A Hobson, Archt. 82, Albion-street, Leeds .	No da'e
Additions to School, near Pannal, Yorks.....	Trustees	T. E. Marshall, Archt. Harrogate	do.
House, Duchy-road, Harrogate	.....	J. M. Fawcett & Son, Archts. 28, Albion-street, Leeds	do.
Business Premises, Peter's Hill, &c. Belfast	.....	J. Armstrong, 16, Shankhill-road, Belfast..	do.
Two Houses and Shops, Chopwell	.....	T. Atkinson, 6, South-av. Eyton-on-Tyne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised	Salary.	Applications to be in.
*Surveyor	Ilford U.D.C.	400l. rising to 450l.	Sept. 28
*First and Third Assistant Engineers..	Singapore Municipal Commrs.....	1st, 250 dols. &c. per month, 3rd, 150 dols. &c. per month	Sept. 30
*Surveyor and Inspector of Nuisances	East Grinstead U.D.C.	125l. per ann. and house	Oct. 1
*Sewage Farm Manager	Farnborough U.D.C...	2l. per week	Oct. 5
*Borough Surveyor	Guildford T.C.	250l. rising to 300l. per ann.	Oct. 12

Those marked with an asterisk (*) are advertised in this Number. *Competition, p. iv.* *Contracts, pp. iv., vi., & viii.* *Public Appointments, pp. xviii. & xxi.*

is talk of the formation of a maritime canal between Cette and the Rhône. The cost is estimated at six million francs.——A competition has been opened by the municipality of Pont-à-Mousson for the erection of a building to contain the Savings' Bank, Octroi Offices, and Post and Telegraph Offices. ——Last Sunday there took place at Boulogne, on the Place des Tintelleries, the inauguration of a monument to the memory of the æronaut François Lhoste, the first who (in 1883) effected a balloon passage between France and England. The monument was designed by M. Thomas, the Director of the Academy of Drawing at Boulogne. ——An Art Exhibition is announced to be held at Angers, from November 8 to January of next year; one at Nantes (by the "Société des Amis des Arts") to open from January 30 to March 14 next year; and one at Reims, to be opened almost immediately and close on November 2.——M. Urbain Basset, sculptor, has been commissioned by the Government to go to Tonkin and Cambodia to study the art and architecture of Kmer.——The death is announced, at Bordeaux, of M. Charles Marionneau, corresponding member of the Académie des Beaux Arts and former President of the Académie at Bordeaux. He was a pupil of Drolling, and exhibited at various Salons from 1849 to 1865. He subsequently devoted himself to historical and critical studies in art. His two principal books are a study on the work of the architect Louis, and another on the painter Brascassat. He was 73 years of age at the time of his death. He had been created Chevalier of the Legion of Honour on the occasion of the centenary of the Institut.——The death is also announced of M. Henry Louis François, a sculptor and engraver of precious stones, and a pupil of Bonnat and of Chapu. He made a speciality of cameo engraving on onyx. He received medals at the Salons of 1882 1883 and 1889, and was named Chevalier of the Legion of Honour in 1888. The Luxembourg contains the following works by him: "Venus rising from the Sea," "Filial Affection," "Sappho," "Andromeda," and "Cephalus and Procris."

MISCELLANEOUS.

TENDERS: A CORRECTION.—Mr. Henry Leney writes: "I observe that in the *Builder* of September 12, under the heading of 'Tenders,' London. For the conversion of No. 119, Anerley-road, Anerley, into two shops and houses, my tender is put down as being the same as Smith & Son. The correct figures are as follows:—Hanscomb & Smith, 1,150*l.*; H. Ellis, 1,069*l.*; Henry Leney, 944*l.*; W. Smith & Son (accepted), 825*l.*" The figures were printed as supplied to us.

THE RAVENSCAR ESTATE, SCARBOROUGH.—The fourth sale of building sites on the Ravenscar Estate, twelve miles north of Scarborough, was held on the 22nd inst. in the Assembly Room of the Hotel, Mr. Wheatley of London, auctioneer. Sites to the value of 1,400*l.* were sold, the prices obtained being fully 25 per cent. higher than those obtained at a recent public sale of sites at Robin Hood's Bay, a little further north than Ravenscar. Good progress is being made with the road-making on the estate.

DIRECTORY OF RAILWAY OFFICIALS.—The Universal Directory of Railway Officials, compiled by the Editor of *The Railway Engineer* (Mr. Blundstone), is issued by the Directory Publishing Company, and has been revised and brought up to date. It constitutes an index of countries and names of railways (with length and gauge added), and of names of officials, for railways all over the world.

CAPITAL AND LABOUR.

LEEDS BUILDING TRADE DISPUTE.—It is satisfactory to record the termination of this dispute; a final settlement was arrived at on Saturday last, the 19th inst., at a meeting held at the Royal Exchange between representatives of the masters and the men. It will be remembered that there was a demand from the men of one halfpenny per hour, as well as an alteration in the working conditions relative to walking points, &c. The labourers claimed a similar advance, accompanied by the demand that their organisation delegates should be free to approach the men at any time on the works. At the commencement of the strike on May 1 the bricklayers were were getting 8½d. per hour, and the labourers 6d. per hour. There were about 500 labourers and about 800 bricklayers. At the end of the strike there were between 200 and 300 labourers idle. Nearly all the bricklayers found work in the interval, either given by employers who have conceded the conditions requested or in other towns. At the meeting alluded to the masters offered a farthing, subject to certain of the proposed conditions of labour being accepted. That proved unsatisfactory to the representatives of the men, and for a long time negotiations remained stationary. Finally, however, an offer was made from the labourers' representatives to accept a farthing increase now, and another farthing in September, 1897. The result of the settlement is this:—The bricklayers receive an increase of ½d. per hour, bringing the 8½d. up to 9d., and the labourers ½d., making the rate now 6½d. per hour, with the prospect of another ½d. per hour a year hence. Practically there was no limit before as to the number of apprentices and the employers asked for one for every five men. The agreement now is one apprentice to every five men, with a limit of six to each employer. Then there was the question of the use of the wheelbarrow brought forward by the labourers. They were, according to their Union rules, not allowed to wheel bricks direct to the bricklayer, but had to carry them. It is now agreed that this practice be allowed when the bricklayers are on the ground-floor. That rule is not to come into operation until the date of the second increase of ½d. per hour. The employers asked that the walking points be increased to two miles (it was formerly a mile from the centre of the city), and this was agreed to by the representatives of the bricklayers. The proceedings then terminated.

LEGAL.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS IN STAMFORD-STREET, BLACKFRIARS.

THE case of Hudson *v.* Rose and Bird came before Mr. Justice Cave, sitting as Vacation Judge, on Wednesday last, the 23rd inst., it being an application by the plaintiff for an injunction to restrain the defendants from carrying up a chimney shaft so as to obstruct the plaintiff's ancient lights. The notice of motion also asked for a mandatory order that the defendants should remove a portion of the shaft, which already obstructed the lights of the plaintiff.

Mr. Alexander, Q.C., who appeared in support of the motion, said that the plaintiff was the owner in fee of No. 20, Stamford-street, Blackfriars.

His Lordship: What does the other side say?

Mr. Alexander said that a firm of solicitors representing the defendants had written a letter to say that their clients were not in possession of and had no interest in the premises in question, and that they did not intend to take any notice of the proceedings.

The learned counsel said that he could prove, strictly, an undertaking which the defendants gave on September 10, and signed by the managing director, by which they undertook "not to go any higher with their chimney shaft until Monday, &c.," and he therefore asked for an order in the terms of the notice of motion.

His Lordship said that he would grant an injunction to prevent the defendants going any further, but he would not make a mandatory order. As the defendants said that the premises were not their

property, he would not make them take anything down.

After some further discussion, his Lordship granted an injunction restraining the defendants from going any further with their shaft until trial or further order, and that the costs should be reserved until the trial.

ANCIENT LIGHTS.

THE case of Whitcher *v.* Eldridge, Pope. & Co., came before Mr. Justice Cave, sitting as Vacation Judge, on Wednesday last, the 23rd inst., it being an application to restrain the defendants from building so as to obstruct the plaintiff's ancient lights.

Mr. Stuart Smith, when the case was called on, said that he understood that Mr. Alexander, who appeared on the other side, wished that it might stand for a week, he being willing that the *interim* injunction granted by Mr. Justice Chitty should be continued during that period.

Mr. Alexander said that he would agree to that, and his Lordship accordingly ordered that the case should stand over for a week.

ALLEGED INTERFERENCE WITH A PARTY-WALL.

MR. JUSTICE CAVE, sitting as Vacation Judge, on Wednesday last, the 23rd inst., had before him the case of "Huntly-Gordon *v.* Hall," it being a motion by the plaintiff for an injunction to restrain the defendant from alleged interference with a party-wall. His lordship directed that the case should stand till next sittings, on terms agreed upon between the parties.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

18,625.—AIR WARMING AND VENTILATING APPARATUS: *J. G. Wagstaff.*—Relates more particularly to the class of apparatus known as radiators. Inventor claims (1) In a radiator uniting the respective hollow sections with a hollow top and base by means of tapering spigot and socket connexion forced together. (2) In a radiator, forming a similar connexion by means of a tapering spigot or nipple and socket connexion. (3) In a double-rank radiator, forming the hollow section with ribs to abut on the succeeding section and applying end plates. (4) A combination radiator and air heater and ventilator, consisting of stand with air conduit and damper, removable fender, hollow base, and hollow sections, connected in the manner described. (5) In this class of radiators providing an air chamber at the base.

19,560.—DOOR-CLOSING APPLIANCE: *G. Mackie.*—In door closing and checking appliances a hydraulic and telescopic cylinder is employed. This cylinder is formed with inner and outer tubes and provided with an inlet valve and with adjustable discharge aperture.

19,610.—WINDOW FASTENERS: *W. Youlton.*—Consists in the employment of spring rolls in combination with holes in the frame (or metal receivers) or the cheeks of a pivoted sash. Applicable to fanlights and other pivoted sashes.

19,772.—BRICK MAKING: *J. A. Noel.*—The moulds for brick making are formed with movable bottoms and with partitions for facilitating the release of the moulded clay. This principle is applied with modifications to different classes of machines.

19,786.—DISINFECTING SUPPLY TO CLOSETS, URINALS, &c.: *W. Ross.*—In order to supply liquid disinfectants, carbolic acid, Condy's fluid, &c., the inventor fits to the water supply-pipe between cistern and basin a curved branch pipe in connexion with a glass bottle or other receptacle for the disinfecting fluid. The water flush draws up by suction a portion of the contents of this receptacle in its passage to the main soil pipe.

22,565.—DOOR KNOCKERS: *A. Jones.*—Consists of a compound knocker, having an external handle and an internal knocker, the latter being operated by a lever from the former.

3,267.—WATER-CLOSETS: *D. Hurst.*—A combination of a self-flushing closet of flushing cistern and valves for automatically controlling the flow to the cistern, and thence to the closet pan by oscillation of the seat.

NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 7.—19,737, V. Albert and P. Straube, Spring Bolt.—19,763, A. Oscar, Urinals.

SEPTEMBER 8.—19,788, A. Charlier, White Lead.—19,798, J. Kerst, Brickmaking Machines.—19,806, S. Eastow, Windows.—19,838, W. Hearn, Apparatus for Discharging Water from a Cistern.

SEPTEMBER 9.—19,882, J. Mason, Ventilator.—19,916, D. Kennard, Self-locking Lever for Opening and Fastening Sashes or Casements, &c.—19,921, F. Zann and J. Wirtz, Casement and Door Fasteners.—19,936, J. Streiger, Manufacture of Artificial Stone, Preservative Paint, &c.

SEPTEMBER 10.—19,995, L. Bratt and J. Colbran, Fireplaces.—20,020, E. Wood, Quick-drying Paints and Varnishes.—20,027, W. Aitken, Glazed Bricks, Tiles, and Slabs.

SEPTEMBER 11.—20,153, A. Esklin, Windows.

SEPTEMBER 12.—20,189, S. Cairns, Chimney Pots.—20,200, W. Swain and J. Galloway, Flushing Cisterns for Water-closets.—20,236, L. Morrison, Veneer.

PROVISIONAL SPECIFICATIONS ACCEPTED.

11,581.—G. Moreau & A. Poulhiès, Gas Lighting.—13,379, J. Hägen & P. Cowe, Double-locking Safety Bolt.—16,296, W. Stonehewer, Composition Sash Weight.—17,190, J. Ingram, Fittings for Sliding Windows.—17,541, J. Jarvis, Jointing Sanitary and other Pipes.—17,639, J. Gibson, Junior, Flushing Apparatus for Water-closets.—18,026, F. David, Fireproof Partitioning for Buildings.—18,086, S. & J. Dibble, Combined Water-closet and Sink.—18,102, H. Dean & J. Dean, Surface Indicator to indicate position and direction of drains and other pipes.—18,190, J. Spencer, Ladders.—18,295, J. Kleine, Fireproof Ceilings and Floors.—18,486, R. Evered, Flushing Cisterns.—18,597, A. Morrison & M. Ingram, Syphon Cisterns.—18,608, J. Donne, Supporting Window Sashes, &c.—18,622, G. Thomson, Manufacture and Treatment of Artificial and other Stone Roofing, and other Tiles and Enamel and in Apparatus therefor. — 18,623, A. Rammage, Bridge Floors or Decking.—18,676, J. Howie & J. Allan Machines for Dressing Enamelled Bricks, &c.—18,755, G. Hunt, Chimney-tops and Ventilators.—18,876, J. Duckett & Son, Limited, and J. Duckett, Pillars or Supports for Sinks.—18,964, J. Hewitt, Weather Strips for Doors.—18,984, J. Long, Adjustable Seats for Water-closets.—19,020, G. Thomson, Window-frames or Sashes.—19,177, J. Shanks, Syphonal Cisterns for Water-closets, &c.

COMPLETE SPECIFICATIONS ACCEPTED,

Open to opposition for two months.

17,565, R. Hansom, Heating Buildings.—18,532, P. Hart, Ventilating Sewers.—20,540, H. Vaughan, Kilns.—12,478, D. Brümmer, Portable Buildings.—16,436, J. Lenba, Paving Blocks.—17,023, G. Wagner, Circular Saws.—17,176, H. Ives, Sash-fasteners.—733, T. H. Taylor, Open-air Seats.

MEETINGS.

SATURDAY, SEPTEMBER 26

Devon and Exeter Architectural Society.—Excursion to Truro Cathedral. Leave Plymouth 1.20 p.m.

London and Provincial Builders' Foremen's Association.—Meeting at Memorial Hall, Farringdon-road. 7.30 p.m.

Association of Municipal and County Engineers.—Western Counties' District Meeting, Bristol. Reception at 12.15 p.m.

MONDAY, SEPTEMBER 28.

Sanitary Institute.—Dr. A. Winter Blyth on "The Education, Status, and Emoluments of Sanitary Inspectors," 8 p.m.

WEDNESDAY, SEPTEMBER 30.

Builders' Foremen and Clerks of Works' Provident Institution.—Quarterly Meeting of Directors, 8 p.m.

THURSDAY, OCTOBER 1.

Sanitary Institute.—Mr. Herbert Manley on "Sanitary Law," 8 p.m.

SATURDAY, OCTOBER 3.

Sanitary Inspectors' Association.—Annual General Meeting, Carpenter's Hall. 6 p.m.

Sanitary Institute.—Inspection of Sewage and Destructor Works, Ealing. 2.15 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 8.—By FRANKLIN & JONES (at Thame).

Great Milton, Oxon.—A freehold house and enclosure, 72 a. 3 r. 32 p.	£1,500
"Mount Pleasant," and 7 a. 2 r. 32 p., f.	470
"Southam Mead," 6 a. 3 r. 8 p., f.	250
Ickford, Bucks.—Enclosures of land, 19 a. 3 r. 12 p., f.	1,050
Postcombe, Oxon.—Enclosures of land, 28 a. 2 r. 21 p., f.	575

September 11. By FRANK LLOYD (at Whitchurch).

Malpas, Cheshire.—"Cuddington Hall," and 135 a. 1 r. 30 p., f.	7,500

By E. GANDY (at Norwich).

Allostock, Cheshire.—"Sculshaw Lodge," and 52 a. 0 r. 15 p., f.	3,020

September 12.—By FENN & Co. (at Colchester).

Ardleigh, Essex.—"Keeble's or Vince's Farm," 92 a. 0 r. 3 p., f.	1,675

By MESSRS. SPELMAN (at Norwich).

Frettenham, Norfolk.—"The Home Farm," 92 a. 2 r. 10 p., f.	900

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent, r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace cres. or crescent; yd. for yard. &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	£/s/o
Teak, E.I.	load	11/0/0
Sequoia, U.S.R.cu	ft	2/1
Ash, Canada	load	2/15/0
Birch, do.		3/5/0
Elm, do.		3/10/0
Fir, Dantzic, &c.		2/15/0
Oak, do.		3/10/0
Canada		5/0/0
Pine, Canada red		0/0/0
Do. Yellow		2/0/0
Lath, Dantzic, fath		4/10/0
St. Petersburg		5/10/0
Wainscot, Riga		5/0/0
&c., log		2/0/0
Odessa, crown		2/0/0
Deals, Finland		
2nd & 1st std	100	7/10/0
Do. 4th & 3rd		7/10/0
Do. Riga		7/0/0
St. Petersburg, 1st yellow		10/10/0
Do. 2nd yellow		8/10/0
Do. white		9/0/0
Swedish		7/10/0
White Sea		8/10/0
Canada, Pine 1st		22/0/0
Do. do. 2nd		15/0/0
Do. do. 3rd, &c.		7/10/0
Do. Spruce, 1st.		8/0/0
Do. do. 3rd and 2nd		6/10/0
New Brunswick		6/0/0
Battens, all kinds		5/0/0
Flooring boards, sq., 1 in. prep. 1st		9/6/0
Do. 2nd		8/0/0
Other qualities		6/4/6
Cedar, Cuba, ft.		1d
Honduras, &c.		1d
Mahogany, Cuba		1d
St. Domingo cargo av.		1d
Mexican, do. do.		1d
Tobasco, do. do.		1d
Honduras, do.		1d
Box, Turkey	ton	4/0/0
Rose, Rio		7/0/0
Bahia		6/0/0
Satin, St. Doming		0/0/7

TIMBER *(continued).*		
Satin, Porto Rico		0/0/7
Walnut, Italian		0/0/3
METALS.		
Iron—Pig, in Scotland	ton	2/6/0
Bar, Welsh, in London		5/15/0
Do. do. at works in Wales		5/12/6
Do. Staffordshire, in London		5/15/0
COPPER—British cake and ingot		49/0/0
Best selected		49/10/0
Sheets, strong		56/0/0
Chili bars		48/2/3
YELLOW M'TALB		0/-/4½
LEAD—Pig, Spanish	ton	11/5/0
English com. brands		11/7/6
Sheet, English 6 lbs. per sq. ft and upwards		12/0/0
Pipe		12/10/0
ZINC—English sheet	ton	20/10/0
Vieille Montagne		21/0/0
Spelter		16/12/0
TIN—Straits		58/6/3
Australian		60/5/0
English Ingots		61/10/0
Banca		60/10/0
Billiton		59/15/0
OILS.		
Linseed	ton	16/10/0
Cocoanut, Cochin		27/0/0
Do. Ceylon		23/10/0
Palm, Lagos		23/10/0
Rapeseed, English pale		25/10/0
Do. brown		24/0/0
Cottonseed refd.		25/10/0
Olaine		29/0/0
Lubricating U.S.		0/6/0
Do. black		0/4/9
TAR—Stockholm barrel		1/8
Archangel		0/12/6
TURPENTINE—(American)	ton	28/15/0

		14/0/0
		11/6/0
		6/-/-
		1/-
		1/-
		1/-
		2/3
		1/-
		1/-
		1/-
		15/0/0
		16/0/0
		15/0/0
		0/0/0
		0/0/0
		2/0/0
		0/0/0
		0/0/0
		0

LONDON.—For pulling down and rebuilding Nos. 1, 2, and 3, Bird-in-Hand-court, Cheapside, E.C., for the City Parochial Charities. Messrs. Herbert Winstanley and G. Harold Elphick, joint architects, Broad-street House, New Broad-street, E.C. :—

Falkner & Sons	£4,835	W. Downs	£4,437
Colls & Sons	4,672	Patman & Fotheringham	4,393
Laurence & Son	4,568	Adamson & Sons	4,354
Paramor & Son	4,587	John Greenwood*	4,215
Lovatt	4,578	McCormick & Sons	4,184

* Accepted.

LONDON.—For the superstructure of a block of three warehouses, Golden-lane, for Mr. W. R. Sutton. Mr. John Groom, architect. Mr. Henry Theobald, Surveyor :—

Kilby & Gayford	£10,436	Greenwood	£9,738
Mattock Bros.	9,977	Bywaters	9,720
Nightingale	9,975	Downs	9,596
Grover & Son	9,974	H. L. Holloway	9,500
Woodward & Co.	9,884	Stimpson & Co.	9,430

LONDON.—For the erection of public baths for the Commissioners, Pitfield-street, Shoreditch. Messrs. Spalding Cross & Hare, architects :—

Wilcock	£41,999 0	W. Goodman	£37,136 0
Reason	41,499 0	R. E. Nightingale	36,841 0
Atherton & Dolman	40,919 0	J. C. Chessum	36,755 0
Shurmur	39,801 0	T. H. Kingerlee	35,585 0
McCormick	38,964 0	G. E. Lodd	35,388 0
J. Welbking & Sons	38,547 0	E. J. Saunders	35,217 10
C. Dearing	37,987 18	C. Gray Hill*	35,393 0

* Accepted.

LONDONDERRY.—For the erection of a shirt factory, William-street, for Mr. E. Richards. Mr. T. Johnston, architect, 11, East-wall, Londonderry :—

W. J. Maultsard	£770 0	D. Gillespie	£635 0
J. A. Fulton	731 17	R. Colham	632 0
McClelland & Co., Ltd.	715 0	M. Sweeny	550 0
Shannon & Routledge	692 10	[All of Londonderry.]	

MEXBOROUGH (Yorks).—For levelling, kerbing, flagging, &c., Hope-street, for the Urban District Council. Mr. G. Penwick Carter, C.E., surveyor, Mexborough :—

H. Worthy	£360 0 0	G. Eyre	£281 12 0
J. W. B. Yeadon	296 17 5		

NUNEATON.—For the erection of National Schools for 316 children, including drainage, boundaries, and formation of playgrounds, Stockingford. Messrs. J. R. Veall & Son, architects, Wolverhampton :—

H. Gough	£1,813 0 0	Kelly & Son	£1,539 0 0
H. Willcock & Co.	1,778 0 0	T. Wincott, Nuneaton*	1,435 12 3
J. Wilson	1,638 0 0		
J. Simpson	1,561 0 0		

* Accepted subject to alterations.

REDHILL.—For the erection and completion of lodge, Bath Hill, Redhill. Mr. Gerard D. Morrison, architect, Reigate :—

I. J. Carrick	£445	Nightingale Bros.*	£419
D. Debenham	420		

* Accepted.

SMETHWICK.—For sewering, levelling, paving, &c., Forster-street, and others, for the Urban District Council. Mr. J. C. Stuart, C.E., surveyor, Public Buildings, Smethwick :—

Forster-street.

T. Mayes, West Bromwich	£675 0 0

Downing-street.

T. Mayes, West Bromwich	308 0 0

Cornwall-road.

J. Mackay, Smethwick	503 16 5

Church Street-passage.

A. Cooper, Smethwick	99 0 0

SOUTHAMPTON.—For alterations and additions to the "Old Farm House," Mount Pleasant, for Messrs. Scrase & Co., Ltd. Mr. William Burrough Hill, architect :—

Playfair & Toole	£402
Bagshaw & Son, Southampton (accepted)	392

SOUTHAMPTON.—For rebuilding the Dorsetshire Arms, St. Mary's-street, Southampton, for Messrs. W. Aldridge & Son, Bedford Brewery. Mr. W. B. Hill, architect :—

Brinton & Bone	£879	H. Stevens & Co.*	£850

* Accepted.

SOUTHAMPTON.—For the erection of a house and shop on the Hampton Park Estate, Swaythling, for Mr. John Henry Smith. Mr. William Burrough Hill, architect :—

H. Cawte	£1,700	Playfair & Toole	£1,347
J. J. Udall & Co.	1,396	Jenkins & Sons	1,337

All of Southampton.]

SOUTHAMPTON.—For road-making and drainage, Hollybrook Avenue Estate, Shirley, for the County of Hants Land and Building Society, Limited. Mr. W. B. Hill, surveyor :—

Playfair & Toole	£850 0 0	W. W. Batten	£618 9 0
Joseph Butt	653 11 4	H. Saunders & Co., Bournemouth*	566 0 0
Osman	645 0 0		
Jenkins & Sons	644 0 0		

* Accepted.

For Fencing to the above Estate.

Fletcher & Son	£153 16 4
J. B. Smith & Son, Baddesley (accepted)	148 5 0

WIMBLEDON.—For the erection of a caretaker's cottage, Haydon's-road Recreation Ground, for the Urban District Council. Mr. C. H. Cooper, engineer :—

J. Milledge & Sons	£560	J. Burges, Wimbledon*	£520
Whitehead Bros.	502		

* Accepted.

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